

BENTONE® 128

Rheological Additive for drilling muds and working fluids in low temperature environments

GENERAL INFORMATION

BENTONE 128 additive is a moderate downhole temperature performance organoclay designed to deliver rapid dispersion and good sag resistance properties. **BENTONE 128** is specifically designed to provide rapid rheology build in low temperature field conditions down to 35°F (2°C). Under these conditions, **BENTONE 128** will effectively viscosity invert and all-oil muds formulated with diesel, mineral oil, and poly, linear and iso alpha olefins base fluids.

CHEMICAL & PHYSICAL PROPERTIES

Composition	organic derivative of a bentonite clay
Color	very light cream
Form	finely divided powder
Specific gravity	1.6
Moisture	3.0%

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

APPLICATIONS

Viscosifying drilling fluids including:

- Oil-based drilling muds
- Invert emulsion muds
- Packer fluids
- Completion fluids
- Workover fluids

Based on:

- Diesel oil
 - Crude oil
 - Mineral oil
 - Diesel oil
 - Synthetic oils
- Conditioning mud before storage
 - Increasing suspending properties of packer fluids
 - Preparing spotting fluids to free stuck pipe

ATTRIBUTES

- Gellant
- Disperses easily with less shear
- Yields at temperatures as low as 35°F/2°C, versus conventional organoclays
- Highly efficient in low aromatic mineral oils and other low toxicity base fluids
- Effectively suspends weighting materials and drilling solids
- Not harmful to the environment

INCORPORATION

As **BENTONE 128** is an easier-dispersing organoclay, less work will be needed to incorporate it into the drilling fluid, and the need to circulate down-hole to build full rheology is significantly reduced. Moderate agitation is required to disperse **BENTONE 128** into the base fluid, where it will rapidly develop rheology.

The amount of stirring needed during incorporation will depend on the temperature of the oil. At room temperature, when only moderate shear is used, gelation should begin in 10 to 15 minutes. Increased levels of shear will shorten the mix time. As the oil temperature is reduced, more time will be needed for viscosity build to begin. **BENTONE 128** will gel oils at temperatures as low as 35°F/2°C, but prolonged agitation will be required, especially if only moderate shear is available.

A chemical polar activator is not required to ensure full development of rheological properties when **BENTONE 128** is used in invert muds, where water acts as the activator. In low polarity fluids, such as low aromatic mineral oils, **BENTONE 128** will build rheology with mixing.

In all-oil systems or in low polarity fluids where no water is included in the formulation, or where water is unwanted, a chemical activator is generally required to rapidly build yield. Mixing 5% water, by weight, into the activator can enhance its efficiency.

continued...

BENTONE® 128

BENTONE 128:

<i>Suitable chemical activators</i>	<i>Use level as percentage of BENTONE 128 weight</i>
Methanol/water (95/5)	11 %
Propylene carbonate	11 %
Propylene carbonate/water 95/5	11 %

LEVELS OF USE

The level of use depends on the rheological properties needed, and on the type of base oil being used. Pilot trials are recommended to optimize performance before field use.

<u>Mud Type</u>	<u>Pounds per Barrel</u>	<u>Kg/m³</u>
All-Oil		
Diesel Oil	4 - 10	11 - 28
Mineral Oil	8 - 12	23 - 34
Invert Emulsions		
Diesel Oil	2 - 6	6 - 17
Mineral Oil	5 - 9	14 - 26
Alpha olefins (PAO, LAO, IAO)	5 - 10	14 - 28

PERFORMANCE

Invert Muds

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 128, ppb	3
Fluid Loss Additive, ppb	8
Barite, ppb	325
Brine, 30% CaCl ₂ , bbl	0.17

Properties

	<u>Initial</u>	<u>@250°F</u>
Plastic Viscosity, cPs	40	41
Yield Point, lbs./100 ft ²	14	10
Gels, 10 sec/10 min, lbs./100 ft ²	10/11	9/11
ES, volts	713	601
Brookfield, 0.3 RPM, cPs	28,000	26,000

Mineral Oil Invert, 80/20, 14 ppg

Aged 16 hrs. @ 300°F, Tested @ 120°F

Formulation

Mineral Oil, bbl	0.52
Primary Emulsifier, ppb	9
Secondary Emulsifier, ppb	2
Lime, ppb	5
BENTONE 128, ppb	6
Fluid Loss Additive, ppb	8
Barite, ppb	325
Brine, 30% CaCl ₂ , bbl	0.17

Properties

	<u>Initial</u>	<u>300°F</u>
Plastic Viscosity, cPs	42	52
Yield Point, lbs./100 ft ²	12	11
Gels, 10 sec/10 min, lbs./100 ft ²	10/12	6/11
ES, volts	760	700
Brookfield, 0.3 RPM, cPs	21,200	21,200

IAO Invert, 80/20, Unweighted

Aged 16 hrs. @ 300°F, Tested @ 120°F

Formulation

IAO, bbl	0.8
Primary Emulsifier, ppb	10
Secondary Emulsifier, ppb	3
Lime	1
BENTONE 128, ppb	10
Brine, 30% CaCl ₂ , bbl	0.2

Properties

	<u>Initial</u>	<u>@300°F</u>
Plastic Viscosity, cPs	14	13
Yield Point, lbs./100 ft ²	11	12
Gels, 10 sec/10 min, lbs./ 100 ft ²	9/9	8/10
ES, volts	765	376
Brookfield, 0.3 RPM, cPs	22,400	26,100

BENTONE® 128**All-Oil Muds*****All-Oil, No Polar Activator****Aged 16 hrs. @ 150°F-Tested @120°F****Formulation**

Base Oil, bbl (#2 Diesel or Mineral Oil)	0.78
Emulsifier, ppb	0.75
Lime, ppb	1
BENTONE 128, ppb	5 or 10
Barite, ppb	325

All-Oil, No Polar Activator**Aged 16 hrs. @ 150°F - Tested @120°F****Properties - #2 Diesel**

	Initial	
	<u>5 ppb</u>	<u>10 ppb</u>
Plastic Viscosity, cPs	15	19
Yield Point, lbs./100 ft ²	3	32
Gels, 10 sec/10 min, lbs./ 100 ft ²	3/5	13/14
Brookfield, 0.3 RPM, cPs	16,000	8,800

Properties – Mineral Oil

	Initial	
	<u>5 ppb</u>	<u>10 ppb</u>
Plastic Viscosity, cPs	14	22
Yield Point, lbs./100 ft ²	2	10
Gels, 10 sec/10 min, lbs./ 100 ft ²	2/9	6/10
Brookfield, 0.3 RPM, cPs	8,800	13,200

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

All muds tested at 120°F.

HEALTH AND SAFETY DATA

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

NOTE: The information herein is currently believed to be accurate. We do not guarantee its accuracy. Purchasers shall not rely on statements herein when purchasing any products. Purchasers should make their own investigations to determine if such products are suitable for a particular use. The products discussed are sold without warranty, express or implied, including a warranty of merchantability and fitness for use. Purchasers will be subject to a separate agreement which will not incorporate this document.

© Copyright 2019, Elementis Specialties, Inc. All rights reserved. Copying and/or downloading of this document or information therein for republication is not allowed unless prior written agreement is obtained from Elementis Specialties, Inc.

© Trademark of Elementis Specialties, Inc.

V01 Aug. 2019

North America

Elementis
469 Old Trenton Road
East Windsor
NJ 08512, USA
Tel.: +1 609 443 2500
Fax: +1 609 443 2422

Europe

Elementis UK Ltd.
c/o Elementis GmbH
Stolberger Strasse 370
50933 Cologne, Germany
Tel.: +49 221 2923 2066
Fax: +49 221 2923 2011

Asia

Deuchem (Shanghai) Chemical Co., Ltd.
99, Liayang Road
Songjiang Industrial Zone
Shanghai, China 201613
Tel.: +86 21 5774 0348
Fax: +86 21 5774 3563