

CLAYMINTON Inc.

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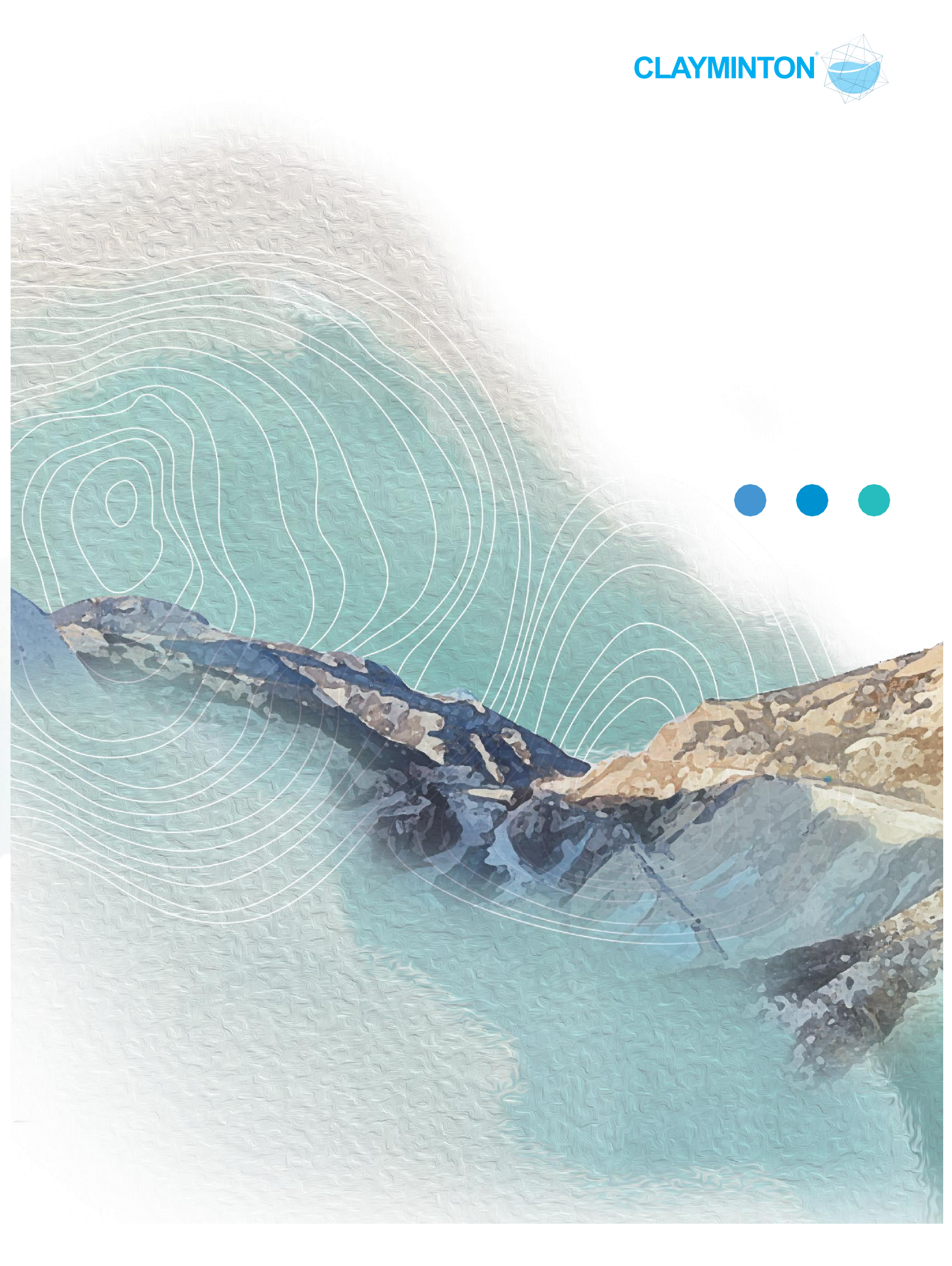
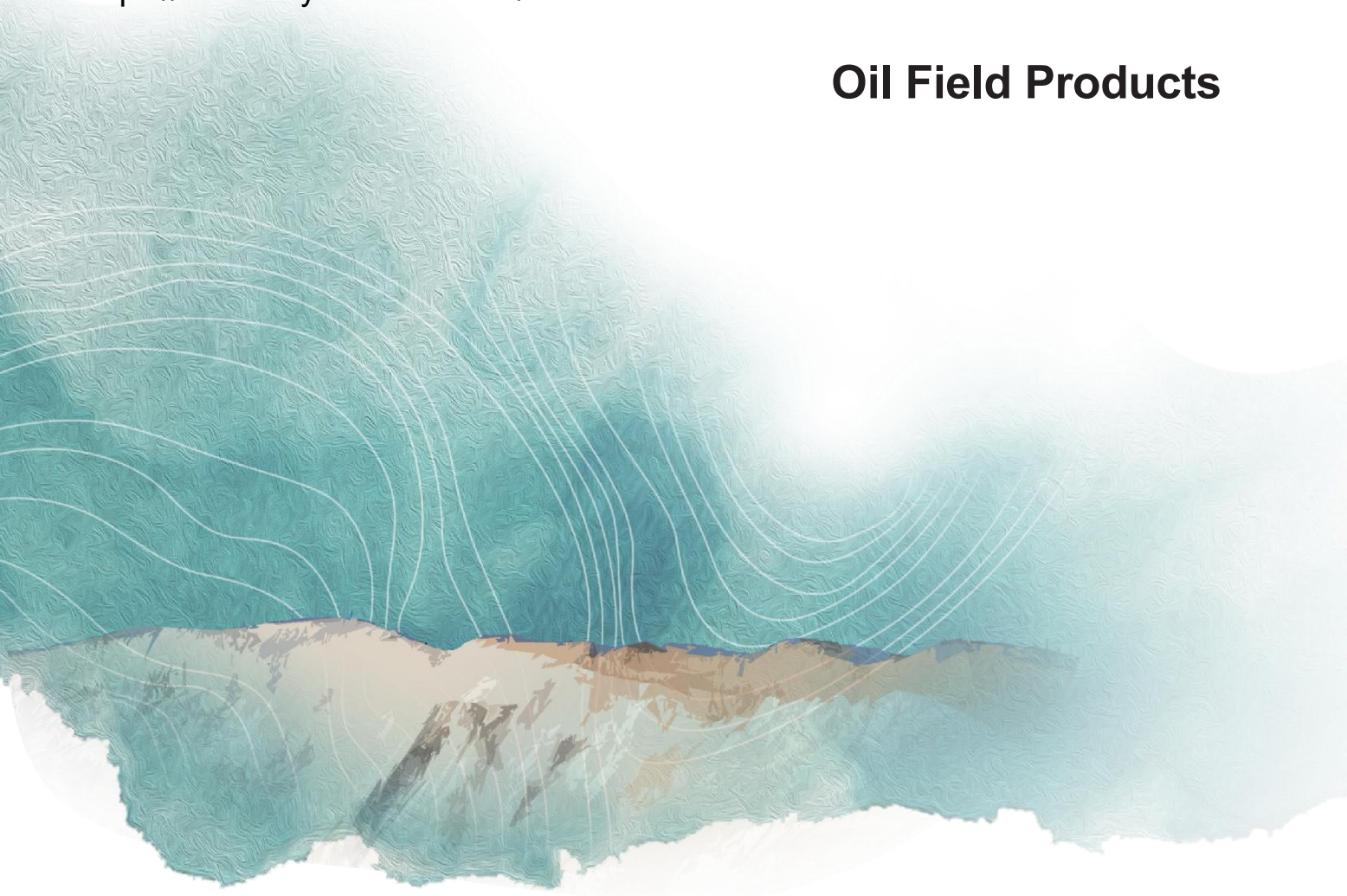
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Oil Field Products



CLAYMINTON INC

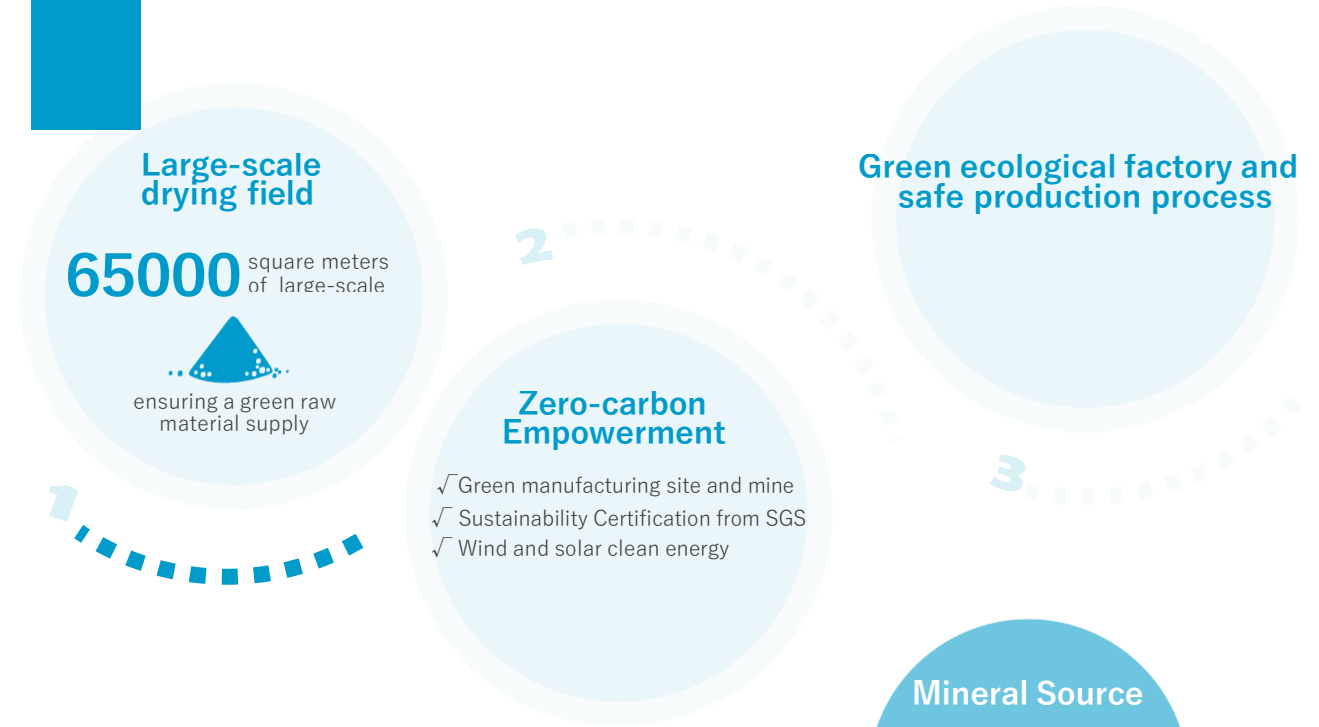
INTRODUCTION

CLAYMINTON INC. is a registered supplier of inorganic and organic bentonite rheology modifier products registered in Houston, Texas, U.S.A. Its products are used in various fields, including paints and coatings, inks, agricultural chemicals, oil fields, foundry, colorant, paper, printing ink, textile and other composite materials. We adhere to the principles of natural, low-carbon, healthy and sustainable development. We not only provide global customers with leading inorganic and organic bentonite clay rheological additive solutions, but also offer professional technical support and customer formulation optimization, to deliver a full range of innovative green solutions.

Innovative, Nature Minded, Health, and Sustainable Growth



Competitive Advantages



Mineral Source
Unique raw ore that provides higher purity and whiteness



CLAYMINTON®



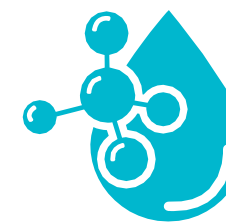
We offer **CLAYMINTON® WF**-series of bentonite products for aqueous drilling fluids and **CLAYMINTON® OF** series of products for oil-based drilling fluid systems.



CLAYMINTON® WF-5 AND WF-6 are suitable for high-temperature and high-pressure drilling fluid systems with excellent dispersibility and suspending capability, excellent resistance to filtration loss. They not only provide excellent suspension properties for weighing materials and drill cuttings but also have less effect on the apparent viscosity of the system. They could significantly enhance the lubricating performance of drilling fluid, reduce the friction and wear of drilling tools. They are compliant with **API 13A, Q/SY 17009-2019, Q/YRH04-2024 and GB/T5005-2010.**

CLAYMINTON® OF-series products are for oil-based drilling fluid (diesel, mineral, and/or synthetic oil). They perform self-activation, good dispersibility, excellent suspension property as well as excellent resistance to filtration loss. **CLAYMINTON® OF-218, and OF-318** are designed for HTHP applications. The products meet **Q/SH CGO190-2023, Q/SY 17817-2021** drilling fluid related standards.

According to test results of third-party laboratories in the USA, **CLAYMINTON® OF**-series products achieved excellent overall performance based on **API RP B** method in diesel and other base oil drilling fluid systems.



- ⊙ Highly efficient development of rheological properties
- ⊙ Rapid yielding ability
- ⊙ Eliminates the need for chemical activators.
- ⊙ Superior suspension properties and controlling settling in diesel, mineral, and synthetic oil-based drilling fluids

- ⊙ Excellent static stability after hot rolling, without any syneresis or separation of oil
- ⊙ Excellent resistance to filtration loss
- ⊙ Temperature stable to 220-240 °C
- ⊙ Not harmful to the environment

Our professional technical service team is committed to supporting customer formulation improvement, application development as well as product innovation, and enhance customer's drilling fluid performance.



CLAYMINTON® WF Series for Water Based Drilling Fluids



Water based clay products – WF-series

| Product | Description | Features and Advantages | Application | Dosage |
|------------------|----------------------------|---|-----------------------------|-------------------------|
| CLAYMINTON® WF-1 | Refined bentonite | Cost effective, specifically designed for water-based drilling fluids. Efficient rheological properties. Rapid yielding, good dispersibility, excellent suspension and controlling cutting settling. Good resistance to filtration loss. Temperature stable to 150 °C . No harm to the environment. | Water-based drilling fluids | 25-45 KG/M ³ |
| CLAYMINTON® WF-2 | Refined bentonite | Cost effective, specifically designed for water-based drilling fluids. Efficient rheological properties. Rapid yielding, good dispersibility, excellent suspension and controlling cutting settling. Good static stability after hot rolling. Temperature stable to 150 °C . No harm to the environment. | Water-based drilling fluids | 25-45 KG/M ³ |
| CLAYMINTON® WF-5 | High-performance bentonite | High-performance HTHP bentonite clay for water-based drilling fluids. Efficient rheological properties. Rapid yielding, good dispersibility, excellent suspension and controlling cutting settling. Good static stability after hot rolling. Temperature stable to 240 °C . No harm to the environment. | Water-based drilling fluids | 25-45 KG/M ³ |
| CLAYMINTON® WF-6 | High-performance bentonite | High-performance HTHP bentonite clay for water-based drilling fluids. Efficient rheological properties. Rapid yielding, good dispersibility, excellent suspension and controlling cutting settling. Good static stability after hot rolling. Temperature stable to 240 °C . No harm to the environment. | Water-based drilling fluids | 25-45 KG/M ³ |



Rheological and filtration properties of water-based drilling fluids with WF-5 and WF-6.



CLAYMINTON® OF Series for Oil-Based Drilling Fluids



Organoclay products – OF series

| Product | Description | Features and Advantages | Application | Use Level |
|---------------------------|-----------------------------|--|---|------------------------|
| CLAYMINTON® OF-213 | Cost effective organoclay | Cost effective, easily dispersible, self-activating organic clay, Efficient rheology modifier. Excellent suspension properties for controlling cutting settling. Good emulsion stability. Low filtration loss. Application for temperature up to 150 °C . No harm to the environment. | Diesel based drilling fluids | 25-45KG/M ³ |
| CLAYMINTON® OF-215 | Cost effective organoclay | Unique cost effective, rapid yield, self-activating organic clay, Efficient rheology modifier. Excellent suspension properties for controlling cutting settling. Good emulsion stability. Low fluid loss. Stable at temperature up to 180 °C . No harm to the environment. | Diesel and synthetic based drilling fluids | 25-45KG/M ³ |
| CLAYMINTON® OF-217 | High performance organoclay | High efficiency rheology modifier. Rapid yielding, superior properties for cutting suspension. Excellent emulsion stability. Good salt tolerance. Stable at temperature up to 200 °C . No harm to the environment. | Diesel, mineral and synthetic oil-based drilling fluids | 25-45KG/M ³ |
| CLAYMINTON® OF-218 | High performance organoclay | High efficiency rheology modifier. Rapid yielding, superior cutting suspension properties. Excellent emulsion stability. Good salt tolerance. Stable at temperature up to 220 °C . No harm to the environment. | Diesel, mineral and synthetic oil-based drilling fluids | 25-45KG/M ³ |
| CLAYMINTON® OF-318 | High performance organoclay | High efficiency rheology modifier. Rapid yielding, superior cutting suspension properties. Excellent emulsion stability. Good salt tolerance. Stable at temperature up to 240 °C . No harm to the environment | Diesel, mineral and synthetic oil-based drilling fluids | 25-45KG/M ³ |

Performance examples:

In a diesel-based drilling fluid system, CLAYMINTON® OF-213 has outstanding performance compared to a market product as shown in the figure.

Clayminton 213 & Market product A - 2.0 SG at 120°C

| Constituent | Time, min | 1 lab bbl grams | 2x | 1 lab bbl | 2x |
|------------------------|-----------|--------------------|-----|-----------|-----|
| 1 Diesel | | 125 | 250 | 125 | 250 |
| 2 Emul 1, HeMul 250 | 5 min | 6 | 12 | 6 | 12 |
| 3 Lime | 5 min | 6 | 12 | 6 | 12 |
| 4 FL1, Asphaltite LT | 10 min | 8 | 16 | 8 | 16 |
| 5 CaCl2 Brine 28% | 10 min | 39 | 78 | 39 | 78 |
| 6 OF 213 | 10 min | 2 | 4 | 2 | 4 |
| 7 Market product A | 10 min | | | 2 | 4 |
| 8 Barite (to 16.67ppg) | 10 min | 388.5 | 777 | 388.5 | 777 |
| 9 | | | | | |
| 10 | | | | | |

Leave in cup @150F, covered for 30 mins

| | Clayminton 213 | | Market product A | |
|----------------------------------|----------------|--------|------------------|------------------|
| Mud weight | 2 | | 2 | |
| BHR | AHR | BHR | AHR | |
| RPM | OF-213 | OF-213 | Market Product A | Market Product A |
| 600 | 74.3 | 72.8 | 83.3 | 70.7 |
| 300 | 38.6 | 39.4 | 47.5 | 39.1 |
| 200 | 27.3 | 29 | 35.4 | 29.2 |
| 100 | 16.5 | 17.9 | 23.2 | 18.3 |
| 6 | 4.1 | 4.6 | 8.9 | 5.6 |
| 3 | 3.4 | 3.6 | 7.8 | 4.9 |
| PLASTIC VISC. | 35.8 | 33.1 | 35.8 | 30.7 |
| YIELD POINT | 2.8 | 6.1 | 11.2 | 8.2 |
| GELS 10" | 4.6 | 4.2 | 8.8 | 5.9 |
| GELS 10' | 6.2 | 5.3 | 9.9 | 6.8 |
| Average ES | 719 | 943.4 | 843 | 1024.6 |
| API Fluid loss-mL | | 0 | | 0 |
| Filter Cake-mm | | 1 | | 1 |
| HPHT Fluid Loss (248F/120 °C)-mL | | 0.2 | | 0.2 |
| HPHT Filter Cake-mm | | 1 | | 1 |

**Comparison of OF-213 and Market Product A
SG=2.0, HotRolled @ 120 °C (248 °F)**

**HTHP Grace M7500 @120 °C, 2000 psi
SG=2.0**

| HPHT Grace M7500 @120°C, 2000 psi | | |
|-----------------------------------|--------|------------------|
| rpm | OF-213 | Market product A |
| 600 | 58.2 | 63.2 |
| 300 | 29.7 | 32.4 |
| 200 | 21.3 | 24.1 |
| 100 | 11.1 | 12.1 |
| 6 | 4.7 | 6.6 |
| 3 | 3.4 | 6.3 |
| 10' Gel | 3.3 | 4 |
| 10" Gel | 2.9 | 4.8 |
| PV | 28.5 | 30.8 |
| YP | 1.2 | 1.6 |



CLAYMINTON® OF Series for Oil-Based Drilling Fluids

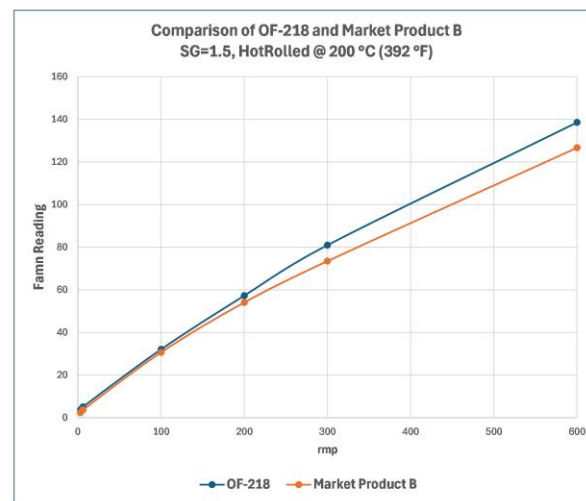


CLAYMINTON® OF-218 is a new high performance organoclay for diesel, mineral and synthetic based drilling fluids. Its performance compared to a market product is shown in the figure below:

Clayminton OF-218 & Market product B - 1.5 SG at 200°C

| | | 1 lab bbl | 2x | 1 lab bbl | 2x |
|--|-----------|-----------|-----|-----------|-----|
| Constituent | Time, min | grams | | | |
| 1 Diesel | | 125 | 250 | 125 | 250 |
| 2 Emul 1, HeMul 401 | 5 min | 6 | 12 | 6 | 12 |
| 3 Emul 2, HeMul 402 | 5 min | 6 | 12 | 6 | 12 |
| 4 Lime | 5 min | 6 | 12 | 6 | 12 |
| 5 FL1, NA | 10 min | 8 | 16 | 8 | 16 |
| 6 FL2, Pliolite DFO1 | 10 min | 2 | 4 | 2 | 4 |
| 7 CaCl ₂ Brine 28% | 10 min | 39 | 78 | 39 | 78 |
| 8 OF-218 | 10 min | 2 | 4 | | |
| 9 Market product B | 10 min | | | 2 | 4 |
| 10 Barite | 10 min | 171 | 342 | 171 | 342 |
| Leave in cup @150F, covered for 30 min | | | | | |

| | Clayminton OF-218 | | Market product B | |
|---------------------------------|-------------------|--------|------------------|------------------|
| Mud weight | 1.49 | | 1.47 | |
| | BHR | AHR | BHR | AHR |
| RPM | OF-218 | OF-218 | Market Product B | Market Product B |
| 600 | 70.9 | 138.6 | 84.3 | 126.7 |
| 300 | 37.4 | 81 | 40.3 | 73.5 |
| 200 | 27.1 | 57.3 | 27.9 | 54.1 |
| 100 | 16.7 | 32.1 | 15.7 | 30.7 |
| 6 | 4 | 5.1 | 1.8 | 3.7 |
| 3 | 3.1 | 3.7 | 1.4 | 2.4 |
| PLASTC VISC. | 33.2 | 57.7 | 36.8 | 55.7 |
| YIELD POINT | 4.6 | 19.7 | 3.4 | 19.6 |
| GELS 10" | 4.3 | 2.2 | 1.4 | 2 |
| GELS 10' | 7.5 | 7.9 | 1.7 | 5 |
| Average ES | 475 | 635.2 | 302.2 | 449.6 |
| API Fluid loss-mL | 0 | | 0 | |
| Filter Cake-mm | 2 | | 1 | |
| HPHT Fluid Loss (356F/180°C)-mL | 2 | | 1.8 | |
| HPHT Filter Cake-mm | 1 | | 2 | |

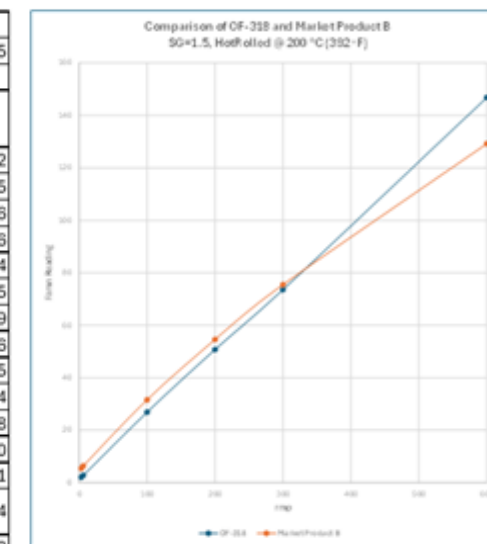


CLAYMINTON® OF-318 is a special enhanced performance product. It's application in a recent ultra-deep well with vertical depth of over 10,000 m at temperature >200 °C was very successful.

Clayminton OF-318 & Market product B - 1.5 SG at 200°C

| | | 1 lab bbl | 2x | 1 lab bbl | 2x |
|---|-----------|-----------|-----|-----------|-----|
| Constituent | Time, min | grams | | | |
| 1 Diesel | | 125 | 250 | 125 | 250 |
| 2 Emul 1, HeMul 401 | 5 min | 6 | 12 | 6 | 12 |
| 3 Emul 2, HeMul 402 | 5 min | 6 | 12 | 6 | 12 |
| 4 Lime | 5 min | 6 | 12 | 6 | 12 |
| 5 FL1, NA | 10 min | 8 | 16 | 8 | 16 |
| 6 FL2, Pliolite DFO1 | 10 min | 2 | 4 | 2 | 4 |
| 7 CaCl ₂ Brine 28% | 10 min | 39 | 78 | 39 | 78 |
| 8 OF-318 | 10 min | 2 | 4 | | |
| 9 Market product B | 10 min | | | 2 | 4 |
| 10 Barite | 10 min | 171 | 342 | 171 | 342 |
| Leave in cup @150F, covered for 30 mins | | | | | |

| | Clayminton OF-318 | | Market product B | |
|---------------------------------|-------------------|--------|------------------|------------------|
| Mud weight | 1.47 | | 1.5 | |
| | BHR | AHR | BHR | AHR |
| RPM | OF-318 | OF-318 | Market Product B | Market Product B |
| 600 | 66.4 | 146.8 | 67.1 | 129.2 |
| 300 | 35.7 | 73.6 | 32.2 | 75.5 |
| 200 | 26.8 | 50.8 | 21.3 | 54.6 |
| 100 | 17.1 | 26.9 | 11.8 | 31.6 |
| 6 | 5.8 | 2.8 | 1.1 | 6.4 |
| 3 | 5.1 | 2.1 | 0.8 | 5.5 |
| PLASTC VISC. | 27.2 | 58.6 | 28.5 | 54.9 |
| YIELD POINT | 9.6 | 21.5 | 5.6 | 18.6 |
| GELS 10" | 6.2 | 2.7 | 0.8 | 3.5 |
| GELS 10' | 10 | 8.6 | 0.9 | 9.4 |
| Average ES | 694.6 | 545.4 | 292 | 418.8 |
| API Fluid loss-mL | 0 | | 0 | |
| Filter Cake-mm | 2 | | 1 | |
| HPHT Fluid Loss (356F/180°C)-mL | 1.4 | | 2.4 | |
| HPHT Filter Cake-mm | 3 | | 2 | |



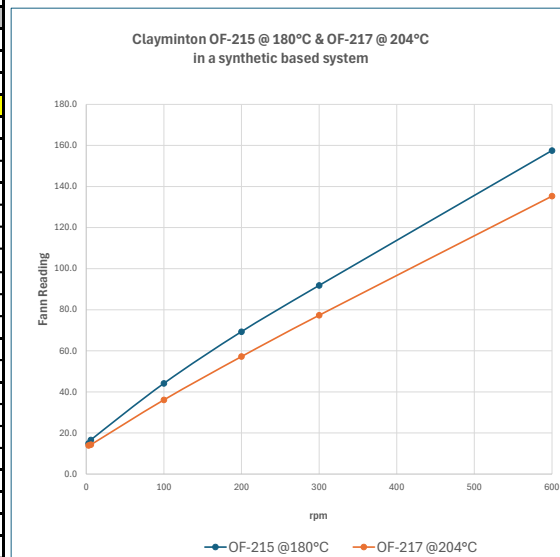


CLAYMINTON® OF Series for Oil-Based Drilling Fluids



In a synthetic based drilling fluid system, CLAYMINTON® OF-215 and OF-217 also have outstanding performance including stable YP/PV ratio, low filtration loss, superior stability without separation issue after hot rolling process as shown below:

| Clayminton OF-215 & OF 217 in a Synthetic Based mud System | | | | | | | |
|--|-----------------------|-----------------------|---------------|--------------|---------------|--------------|--|
| SAMPLE COMPOSITION | | | | | | | |
| and PREPARATION | | | Low | | Hi | | |
| | Constituent | Time, min | Temp | Actual grams | Temp | Actual grams | |
| 1 | Synthetic Oil | 125.00 | | | | | |
| 2 | OF-215 | 2.00 | | | | | |
| 3 | OF-217 | | | 2.00 | | | |
| 4 | Emul 1, | 10.00 | | | | | |
| 5 | Emul 2, | 10.00 | | | | | |
| 6 | Lime | 6.00 | | | | | |
| 7 | CaCl2 Brine 28% | 39.00 | | | | | |
| 8 | FL1, NA | 8.00 | | | | | |
| 9 | FL2, DFO1 | 2.00 | | | | | |
| 10 | Barite (to 17.0ppg) | 510 | | | | | |
| MW=2.05 | | | | | | | |
| TEST RESULTS | | | BHR | AHR | BHR | AHR | |
| TEMPERATURE | Hot-Roll | °F | 150F/65C | 356F/180C | 150F/65C | 400F/204C | |
| PERIOD AGED | Hours | | | | | | |
| RHEOLOGY | | RPM | OF-215 @180°C | | OF-217 @204°C | | |
| | 600 | lb/100ft ² | 133.3 | 157.5 | 143.6 | 135.3 | |
| | 300 | lb/100ft ² | 72.3 | 91.8 | 85.1 | 77.3 | |
| | 200 | lb/100ft ² | 53.2 | 69.3 | 64.8 | 57.2 | |
| | 100 | lb/100ft ² | 32.5 | 44.1 | 42.9 | 36.1 | |
| | 6 | lb/100ft ² | 11.0 | 16.6 | 17.4 | 14.3 | |
| | 3 | lb/100ft ² | 9.8 | 14.9 | 16.1 | 13.9 | |
| AV | | | | | | | |
| PLASTIC VISC. | cP | | 61.2 | 65.1 | 57.3 | 57.8 | |
| YIELD POINT | lb/100ft ² | | 10.6 | 27.4 | 27.1 | 20.2 | |
| GELS 10" | lb/100ft ² | | 12.6 | 20.0 | 18.4 | 20.0 | |
| GELS 10' | lb/100ft ² | | 16.4 | 27.8 | 22.3 | 27.8 | |
| ES | | | 826 | 1292 | 467 | 1999 | |



A complete set of tests on all our products was conducted. Test data are available upon request. Product samples are available for system compatibility and optimization purposes.

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