

**DRILLING
CHEMICALS**



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GEPEC
GE PETROLEUM EQUIPMENT (BEIJING) CO., LTD.



GE PETROLEUM EQUIPMENT (BEIJING) CO., LTD.
GE PETROLEUM EQUIPMENT CORPORATION LLC. (USA)
GE PETROLEUM EQUIPMENT (QINGDAO) CO., LTD.
GE PETROLEUM EQUIPMENT (CANGZHOU) CO., LTD.
GE PETROLEUM EQUIPMENT (CHANGSHU) CO., LTD.
GE PETROLEUM EQUIPMENT (RENQIU) CO., LTD.
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ABOUT US

GE HOLDINGS is an international, integrated oil and gas (GROUP) company specializing in drilling equipment manufacturing and directional drilling technology services. We provide innovative solutions and maintenance to onshore and offshore drilling rigs for all over global customers. With 10 years' development, GE holdings has five manufacturing plants in China and six international branch (offices) in USA, Azerbaijan, Iran, Saudi Arabia, Algeria and Libya.

MAIN PRODUCTS:

Wellhead control equipment, mud pump & fluid end expendables, christmas tree and casing & tubing head and all kinds of valves, cementing tools, drill pipe and drilling collar, (Drilling Chemicals).

О КОМПАНИИ

GE ХОЛДИНГС - это международная интегрированная нефтегазовая компания, специализирующаяся на производстве бурового оборудования и предоставлении услуг в области технологии наклонного бурения. Мы предоставляем инновационные решения и техническое обслуживание буровых установок на суше и на шельфе для всех глобальных клиентов. За 10 лет развития GE холдинг обзавелся пятью заводами в Китае и шестью международными филиалами (офисами) в США, Азербайджане, Иране, Саудовской Аравии, Алжире и Ливии.

ОСНОВНАЯ ПРОДУКЦИЯ:

Оборудование для контроля давления на устье скважины, буровые насосы и расходное оборудование напорной части, фонтанная арматура, головка обсадной колонны и насосно-компрессорная головка, все виды клапанов, инструменты для цементирования, буровые трубы и утяжелённые буровые трубы.



CERTIFICATES & QUALIFICATIONS

СЕРТИФИКАТЫ И КВАЛИФИКАЦИИ



Base Oil and Chemicals

GEPEC is offering Commodity Chemicals, chemicals for Water Based Mud and chemicals for Oil Based Mud. Most of the products are being manufactured by our Malaysia plant and remained ones being sourced from China, Singapore, Malaysia and USA.

GEPEC has exclusivity for selling SK product base oil to CIS, Turkey, Iran and others countries. SK DF1 base oil is being used by worldwide recognized mud service companies in Malaysia, Russia, Azerbaijan, Turkmenistan and others countries.

GEPEC can offer whole package for drilling fluid as per clients' requirement.



Chemicals

Oil Based Mud	Water Based Mud	Commodity Chemicals
1.LUBE R	1. Barite 4.1 SG	1. Calcium Bromide (liquid) 52%
2.MUL VS 2	2. Barite 4.2 SG	2. Calcium Bromide 96% (powder)
3.Primary Emulsifier 350	3. Bentonite	3. Calcium Chloride 94% (powder)
4.SCAV Z	4. CMC HV Sodium Carboxymethyl Polymer	4. Potassium Chloride 95% KCL (powder)
5.Secondary Emulsifier 350	5. CMC LV Sodium Carboxymethyl Polymer	5. Potassium Chloride 98% KCL (powder)
6.Thin	6. Gilsonite	6. Potassium Formate 96% (powder)
7.VIS-1000°C	7. PAC LV 70%, PAC LV 85%, PAC LV 95%	7. Sodium Bromide (liquid) 1.45 SG NaBr
8.VIS-Poly	8. PAC R 70%, PAC R 85%, PAC R 95%	8. Sodium Bromide 98.5% (powder)
9.VIS-RM-2000	9. PHPA	9. Sodium Formate 95% (powder)
10.WET	10. Xanthan Gum	

1. Base Oil

1.1 Base Oil SK-DF1:

Description

SK-DF1 does not have any components destroying stratospheric ozone. It is hydrocarbon solvent of high boiling point and have high stability with bio-degradation capability, being used as Base Oil for drilling fluid.

Typical Properties

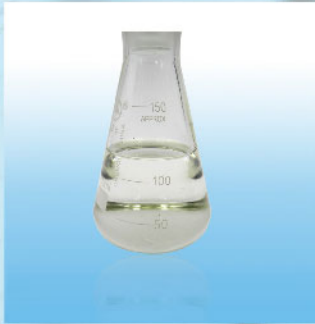
Parameter	Specification
Specific Gravity, 60/60°F	0.8000-0.8400
Color Saybolt	Min. +28°C
Flash Point	Min. 80 °C
Aniline Point	Max. 80 °C
Aromatic Content	Max. 0.5
Distillation	Initial Boiling Point - Min. 200°C
	End Point - Max. 282°C

Application

SK-DF1 is a low viscosity, high flash point, high biodegradability and low toxicity base oil. It has been technically proven and is widely used in drilling operations by major E&P companies worldwide.

Packaging

SK-DF1 can be delivered in 19 Mt per Flexi Tank of 15 MT per ISO Tank.



2. Commodity Chemicals

2.1 Calcium Bromide 52% liquid:



Typical Properties

Parameter	Specifications
Appearance	Colorless transparent liquid
Main content	≥52.0%
PH (5% solution)	6.0-8.0
Chloride	≤0.5%
Sulphate	≤0.01%
Heavy Metal (Pb)	≤0.0005%
Water Insoluble	≤0.3%
BrO ₃ ⁻	Non-reaction
Specific Gravity (20°C)	≥1.70g/cm ³
Packaging	340kg PE Drums or 1000L IBC Drums



2.2 Calcium Bromide Solid:

Typical Properties

Parameter	Specifications
Appearance	White Particle or Massive Crystal
Main Content	96.00% min
Chloride	0.50% max
Sulphate	0.02% max
Pb	0.0005% max
Bromate	No Reaction
PH (5% Water Solution)	6.5-9.5
Water Insolubles	1.00% max
Packaging	25kgs PE/PP Bags or 1000kg Jumbo Bag

Application

These fluids are used where formation pressures require densities from 8.4 to 15.3 lb/gal (1007 to 1833 kg/m³) or where the inhibitive properties of a calcium fluid are required to prevent the hydration and migration of swelling clays. CaBr₂ can be mixed with CaCl₂ to obtain densities up to 15.1 lb/gal (1809 kg/m³). When used with ZnBr₂ densities to 19.2 lb/gal (2301 kg/m³) can be achieved.



2.3 Anhydrous Calcium Chloride:

Typical Properties

Parameter	Specifications
Appearance	White Powder
CaCl ₂	94.0% min.
NaCl	3% max.
MgCl ₂	0.2% max.
Water insoluble	0.2% max
Alkalinity as Ca(OH) ₂	0.35% max.
Packing	25kg Bags or 1000kg Jumbo Bags



2.4 Potassium Chloride 95% (Powder):

Molecular Formula: KCL

Description

Potassium chloride powder is a high-purity, dry crystalline inorganic salt. The salt is used to prepare clear brine workover and completion fluids with densities ranging from 8.4 to 9.7 lb/gal (1007 to 1162 kg/m³).



Typical Properties

Parameter	Specifications
Appearance	White Powder
KCl	95.0% Min.
NaCl	3.5% Max.
MgCl ₂	0.8% Max.
K ₂ O	60.0% Min.
Bulk Density	1060 kg/m ³

Application

Potassium Chloride brines are especially beneficial due to excellent shale stabilization in water-sensitive clay/shale formations and clay- containing sandstones. It is often used to enhance inhibition in other brine systems. KCl solutions become saturated around 24% by weight or near 9.7 lb/gal (1162 kg/m³). Because the dissolution rate decreases near saturation, good agitation and heat can be required to attain 9.7 lb/gal (1162 kg/m³) with a crystallization temperature near 59°F (15°C).

2.5 Potassium Chloride 98% (Powder):

Molecular Formula: KCL

Description

Potassium chloride powder is a high-purity, dry crystalline inorganic salt. The salt is used to prepare clear brine workover and completion fluids with densities ranging from 8.4 to 9.7 lb/gal (1007 to 1162 kg/m³).



Typical Properties

Parameter	Specifications
Appearance	White Powder
KCl	98.0% Min.
NaCl	3.5% Max.
MgCl ₂	0.8% Max.
K ₂ O	60.0% Min.
Bulk Density	1060 kg/m ³

Application

Potassium Chloride brines are especially beneficial due to excellent shale stabilization in water-sensitive clay/shale formations and clay- containing sandstones. It is often used to enhance inhibition in other brine systems. KCl solutions become saturated around 24% by weight or near 9.7 lb/gal (1162 kg/m³). Because the dissolution rate decreases near saturation, good agitation and heat can be required to attain 9.7 lb/gal (1162 kg/m³) with a crystallization temperature near 59°F (15°C).

2.6 Potassium Formate 96% Solid:

Parameter	Specifications
Appearance	White Solid with Strong Moisture-Absorbing Performance
Main Content	≥96.00%
KOH	≤0.5%
K ₂ CO ₃	≤1.50%
KCL	≤0.5%
Moisture	≤0.3%
Packaging	PE/PP Bags, 25kg or 50kg per Bag

Typical Properties

Solid product is white crystalline powder, strong moisture-absorbing performance, reducing, density 1.9100g/cm³, easily soluble in water, non-toxic and non-corrosive.

Application

Widely used in completion fluid in oil field.

In leather industry;

As reducing agent in printing & dyeing industry;

As coagulator in cement; or used in the manufacture of carbon black.



2.7 Sodium Bromide 1.45 SG (Liquid):

Parameter	Specifications (Industrial Grade)
Appearance	Colorless Transparent Liquid
Main Content	45.0% min
Chloride (Cl ⁻)	0.60% max
Sulfate (SO ₄ ²⁻)	0.02% max
Pb	0.001% max
As	0.0004% max
Specific Gravity	1.45 g/ml min
Packaging	IBC Drums, 1450kg per IBC Drum, 200L Drums, 290kg per Drum, 4 drums on a pallet



2.8 Sodium Bromide 98.5% Solid:

Parameter	Specifications (Technical Grade)
Appearance	White Crystal or Compacted
Main Content	98.50% min
Loss on Drying	1.00% max
Bromate	Non-reaction
Chloride	1.50% max
Sulfate	0.1% max
Iodine	Qualified
PH (5% Solution)	5.5-10.5
Packing	25 kg PE/PP bags or 1000kg Jumbo Bags



2.9 Sodium Formate Solid:

Typical Properties

Parameter	Specifications
Appearance	White Granule or Crystalline Powder
Main Content	≥95.0%
NaOH	≤2.00%
Na ₂ CO ₃	≤2.00%
NaCL	≤1.50%
Na ₂ S	≤0.06%
Moisture Content	≤1.50%
Packaging	PE/PP BAGS, 25KG PER BAG

Properties

Density 1.429g/cm³, melting point 253°C soluble in ethanol, nontoxic, noncorrosive, with reducing performance, capable of reacting with strong oxidizing agent, freely slaked in air.

Uses

As camouflage acid in leather industry; Applied to catalyst and stable synthetic agent; reducing agent in the printing and dyeing industry; Applied to the manufacture of sodium hydrosulfite, oxalic acid and formic acid.

Precaution for Transportation and Storage

Preventing exposure to moisture in the storage and transportation. If lumping occurs, the properties of the product will not change and it can be used normally after being pulverized.



3. OIL BASED MUD

3.1 Lube R:

Description

Lube R is a solution of modified natural oils which offer excellent lubricity, as well as other surface active properties such as emulsification and wetting.



Typical Properties

Parameter	Specification
Appearance	Amber Liquid
Activity	80%
Viscosity @ 25°C	< 1000 cps
Specific Gravity @ 25°C	0.95

Application

In water based drilling operations, Lube R will help to reduce rotational torque and drag. It can be used in both fresh and or salt water and does not adversely affect drilling fluid properties. It can also be used as a slug treatment to help deal with stuck pipe issues.

Lube R should be applied at a dosage of up to 1% for brines and 1 – 2% for weighted fluids. However, these dosage rates are typical but can vary greatly depending upon the severity of the problems encountered.

3.2 MUL VS 2:

Description

MUL VS 2 is a secondary invert emulsifier, based formulated to provide emulsification and oil wetting properties for oil-based and synthetic drilling fluids. MUL VS 2 is typically used with a primary emulsifier, such as MUL P 350, when formulating a drilling fluid. Many standard emulsifiers are stable to 150°C, however, MUL VS 2 is stable to 200°C.

Typical Properties

Appearance:	Dark liquid
Specific Gravity:	@ 25 °C 0.90-0.92
Flash Point:	(°C) >65



Application

MUL VS 2 is a secondary emulsifier and wetting agent used in conjunction with a primary emulsifier, viscosifiers and fluid loss control agents to formulate an oil-based or synthetic-based drilling fluid. The quantity used depends on the specific conditions required for the drilling mud, but typically ranges from 2-8 ppb.

It should be noted that while MUL VS 2 is stable to 200°C, the other additives in the system (particularly the organophilic clay) must also be stable at this temperature to insure the drilling fluid system performs as expected. MUL VS 2 performs best when used in systems containing lime, although it can be used as a primary emulsifier in lime free systems.

Pilot testing should be conducted to determine optimal addition rates and maintenance rates for this product.

3.3 PRIMARY EMULSIFIER 350:

Description

PRIMARY EMULSIFIER 350 is a primary invert emulsifier formulated to provide emulsification for oil-based and synthetic drilling fluids at temperatures exceeding 175°C. PRIMARY EMULSIFIER 350 is readily dispersible in any base oil. It forms very strong emulsions with high voltage stability, when formulating a drilling fluid.

Typical Properties

Appearance:	Dark liquid
Specific Gravity:	0.92-0.97
Flash Point:	>65 °C



Application

PRIMARY EMULSIFIER 350 differs from other standard primary emulsifiers in that it is formulated with components that show no degradation at temperatures up to 190°C, whereas many standard emulsifiers will begin to degrade above 150°C.

PRIMARY EMULSIFIER 350 is used in conjunction with a secondary emulsifier, such as SECONDARY EMULSIFIER 350, viscosifiers and fluid loss control agents to formulate an oil-based or synthetic-based drilling fluid. The quantity used depends on the specific conditions required for the drilling mud, but typically ranges from 3-6 ppb.

It should also be noted that even though PRIMARY EMULSIFIER 350 will perform at higher temperatures, the other components of the drilling fluid must also be stable at these temperatures (most organophilic clays will begin to degrade at 150°C) to have a drilling fluid that will perform as expected. Usage of gilsonite and a good high temperature wetting agent is recommended.

Pilot testing should be conducted to determine optimal addition rates and maintenance rates for this product.

3.4 SCAV Z:

Description

Hydrogen sulphide is a naturally occurring gas contained by many crude oils. It can also be formed during the refining process. Correct chemical treatment of H₂S will reduce impact on both employees and the environment, but also improve product quality.

SCAV TZ is a Triazine-based H₂S scavenger. It is water soluble, so does not contaminate the product. It reacts more efficiently in the liquid phase and is particularly effective where an immediate reduction in H₂S is critical. It is the preferred treatment type for flare gas, LPG and crude oil.

Typical Properties

Parameter	Specification
Appearance	Clear to Straw Liquid
Activity	35-40%
Viscosity @ 25°C	< 1000 cps
pH	10 – 12
Specific Gravity @ 25°C	1.05

Application

SCAV Z is used to treat out H₂S.

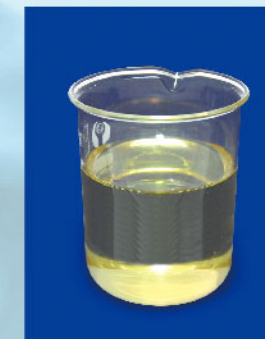
3.5 SECONDARY EMULSIFIER 350:

Description

SECONDARY EMULSIFIER 350 is a secondary invert emulsifier, based formulated to provide emulsification and oil wetting properties for oil-based and synthetic drilling fluids. SECONDARY EMULSIFIER 350 is typically used with a primary emulsifier, such as PRIMARY EMULSIFIER 350, when formulating a drilling fluid. Many standard emulsifiers are stable to 150°C, however, MUL S 350 is stable to temperatures exceeding 175°C.

Typical Properties

Appearance:	Dark liquid
Specific Gravity:	0.90 - 0.95
Flash Point:	>65°C



Application

SECONDARY EMULSIFIER 350 is a secondary emulsifier and wetting agent used in conjunction with a primary emulsifier, viscosifiers and fluid loss control agents to formulate an oil-based or synthetic-based drilling fluid. The quantity used depends on the specific conditions required for the drilling mud, but typically ranges from 4-8 ppb.

It should be noted that while SECONDARY EMULSIFIER 350 is stable to 190°C, the other additives in the system (particularly the organophilic clay and wetting agent) must also be stable at this temperature to insure the drilling fluid system performs as expected.

SECONDARY EMULSIFIER 350 performs best when used in systems containing lime.

Pilot testing should be conducted to determine optimal addition rates and maintenance rates for this product.

3.6 THIN:

Description

THIN is a powerful invert oil mud thinner, particularly effective in high weight muds where unacceptably high gel strengths can be generated. The material does not adversely affect other mud properties and in some cases has been shown to improve HTHP fluid loss.

Additions of 0.5 - 1.5 ppb are normally sufficient to cure most high rheology problems, however care must be taken not to overdose the system and cause loss of mud rheology. Initial treatment should not be greater than 1.0 ppb.



Typical Properties

Parameter	Specification
Appearance	Amber Liquid
Specific Gravity	0.83 @ 25°C
Flash Point	> 70 °C
Pour Point	-5 °C

Application

THIN is used as a thinner.

3.7 VIS-1000 °C:

Description

VIS-1000 °C is a high performance organophilic clay designed for viscosifying oil-base and synthetic drilling fluids. It is used to increase the yield point and gel strengths of the invert emulsion, without significantly affecting the plastic viscosity. VIS-1000 °C also improves emulsion stability and fluid loss control properties of the drilling fluid.



Typical Properties

Appearance:	light tan powder
Specific Gravity:	approx. 1.80
Moisture Content:	3% maximum
Particle size:	> 85% passing 75 micron

Application

VIS-1000 °C has been used in all forms of oil-based and synthetic drilling fluids, including invert muds, spotting fluid formulations, and loss circulation pills. The quantity of product used varies dependent on the base fluid and the desired properties. In diesel oils, a typical requirement would range from 4-10 ppb, while in low toxic and synthetic fluids, 4-14 ppb might be required, depending on the specific nature of the base fluid.

VIS-1000 °C is stable to approximately 320°F (160°C), depending on the drilling fluid.

3.8 VIS-POLY:

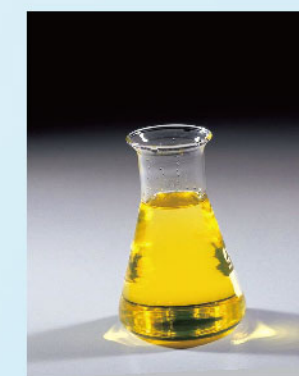
Rheology Modifier

Description

VIS-POLY is a polymeric material developed as a rheology modifier which is used to raise low shear rheology without increasing the plastic viscosity of invert muds. VIS-POLY will also aid in tightening the invert emulsion.

Typical Properties

Appearance:	Amber liquid
Specific Gravity	@ 25 °C 0.87-0.88
Pour Point:	- 5°C
Flash Point:	(°C) >70
Oil solubility:	soluble
Viscosity:	<8000 cps



Application

VIS-POLY is used to increase low shear rheology when required to prevent barite sagging. It is especially useful in horizontal sections where sagging often causes drilling problems. It is recommended that VIS-POLY be added to the invert drilling mud after the organophilic clay in the system has yielded to prevent increased viscosities due to the organo-clay continuing to yield as it circulates.

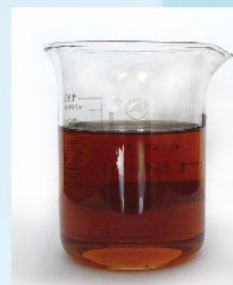
Typically, addition levels of 1-4 ppb of VIS-POLY are required, but pilot testing should be conducted to determine the proper level.

3.9 VIS-RM 2000:

Description

VIS-RM 2000 gellant and rheological modifier is an organic polymer specifically designed to increase viscosity, improve sag control and contribute to the flat rheology of synthetic base drilling fluid systems. The product is stable to 175°C.

VIS-RM 2000 additive works in conjunction with an organophilic clay such as 1000 °C.



Typical Properties

Appearance:	Amber liquid
Specific Gravity:	0.97at 60 F (16 °C)
Flash Point:	>200 F (>93 °C)

Application

VIS-RM 2000 rheological modifier contributes to flat rheology over a wide range of temperatures typically from 4°C to 149°C in synthetic drilling fluid systems. It can be used in synthetic diesel or mineral oil-base drilling fluid systems. VIS-RM 2000 works in synergy with organophilic clays or drill solids to produce flat rheological properties independent of fluid temperature changes. In cold temperature applications, flat rheology allows for the use of higher flow rates with less impact on wellbore pressures than with conventional Non-Aqueous Fluids (NAF).

The required concentration of VIS-RM 2000 depends on the base fluid selected, the drilling fluid density, the Oil or Synthetic to Water Ratio, as well as on the emulsifier package type and concentration. Generally, the required concentration will be between 0.5 and 5.0 lbs/barrel.

While drilling, care should be used to prevent overtreatment by adding VIS-RM 2000 in small increments typically, <0.25 ppb, and monitoring the effects over a minimum of one circulation, VIS-RM 2000 additive may generate excessive viscosities when added to a system with elevated low-gravity solids content. Pilot testing is highly recommended prior to use.

Advantages

- Improves cold temperature viscosities by allowing a reduction in organophilic clay content
- Versatile gelling agent, the effects of which can be reversed (thinned) with chemical treatments
- Product is effective at improving low shear rate viscosities at small concentrations
- Stable to bottom hole temperature to >175°C
- Contributes to enhance the shear thinning profile for improved ROP
- Optimized for use in synthetic-base fluids (e.g., isomerized olefins) but is also compatible with mineral and diesel oil-base drilling fluids
- Minimizes potential for barite sag

Limitations

- Should not be used in combination with any other polymeric rheological additives without pilot testing
- Should not be added unless the system contains organophilic clay or oil-wet reactive drill solids
- Should not be used as a substitute for temporary viscosifiers

Toxicity and Handling

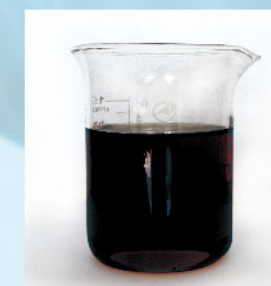
Bioassay information is available upon request.

Handle as an industrial chemical, wearing protective equipment and observing the precautions described in the Material Safety Data Sheet (MSDS).

3.10 WET:

Description

WET is a wetting agent designed to oil wet solids in oil-base and synthetic drilling fluids. WET is typically used with a primary emulsifier, such as EMULSIFIER PE, when formulating a drilling fluid.



Typical Properties

Parameter	Specification
Appearance	Dark Liquid
Specific Gravity	0.90 - 0.92
Pour Point	< -10°C
Flash Point	43°C

Application

WET is a wetting agent typically used in conjunction with a primary emulsifier, viscosifiers and fluid loss control agents to formulate an oil-base or synthetic-base drilling fluid. The quantity used depends on the specific conditions required for the drilling mud, but typically ranges from 2-4 ppb. Over-treatment with WET can cause a decrease in yield point and gels. Pilot testing should be conducted to determine optimal addition rates and maintenance rates for this product.

4. WATER BASED MUD

4.1 Barite 4.1 SG:

Specific Gravity	≥ 4.1	≥ 4.2
Bulk Density	145 lb/ft ³ (2323 g/m ³)	
Particle > 75 Micron	3% max mass fraction	
Solubility in water @ 20 °C	Insoluble	
pH	Neutral	
Soluble Hardness (as calcium)	<250 mg/kg	
Particle > 6 Micron	30 % maximum mass fraction	

4.2 Barite 4.2 SG:

4.3 Bentonite:

Description

Drilling-grade Bentonite is a naturally occurring clay containing the clay minerals of smectite. It can also contain accessory minerals, such as quartz, mica, feldspar and calcite.

Typical Properties



Parameter	Specification
Appearance	Powder
Bulk Density	65 lb/ft ³ or 1120 kg/m ³
Density	2.1 to 2.5 SG
Solubility in Water@20°C	Insoluble

Application

Bentonite has a high swelling capacity in fresh water, providing viscosity and colloidal solids for filtration control with low clay content. The viscosity of Bentonite suspensions can be extended with specific water soluble polymers. Bentonite aids in filtration control by reducing the permeability of the filter cake. The improved texture and quality of the wall cake provides stable borehole conditions. Bentonite develops the necessary viscosity and gel strengths for hole cleaning and suspension of weight materials. Bentonite should be added through the mud hopper with good agitation to maximize the rate of yield and final viscosity. Bentonite can be used in a variety of waters. Optimum viscosity and filtration control values are obtained in fresh water low in hardness. In seawater mud, due to high salt content and divalent ions, Bentonite should be prehydrated in fresh water prior to adding to the system.



4.4 CMC-HV:

Product Name	CMC-HV for Oil Drilling
Appearance	Free-flowing white or yellowish Fibrous powder without caking
Items	Specification
Apparent Viscosity (1% water solution)Mpa.s	≥ 25
PH	≤ 10
Purity %	≥ 95
Water insoluble matter %	≤ 1.0
Particle size (residue on sieve of 0.99mm mesh size)%	6.5 – 8.0

4.5 Low Viscosity Carboxymethylcellulose - CMC LV:

Description

CMC LV is a low viscosity sodium carboxymethylcellulose designed to reduce API filtration rate with minimum increase in viscosity in water based drilling fluids.



Typical Properties

Parameter	Specifications
Moisture%	10%max
Purity %	60% min
Degree of substitution%	0.70 min
Ph	6.0-10.0
Viscosity	10-50

Application & Features

CMC LV is a cost-effective additive to reduce API filtration rate of many water based drilling fluids ranging from freshwater to saturated saltwater. It helps prevent high, progressive gel. It coats the clay cuttings and reduces the hydration.

4.6 Gilsonite:

Description

Gilsonite has been used in oilfield industry as drilling fluids additive in the past several decades, and has received great reputation.



Description	Specification
Appearance	Black powder
Softening Point	≥200°C
Ash Content, %	≤20.0%
Oil soluble content, %	≥70.0%
Screen Size (Passing through 100 meshes sieve) ≥	≥90%

Application

Gilsonite, in various grades and formulations, has been used to combat borehole instability problems, provide lubricity, especially in highly deviated holes, and more recently as a bridging agent to combat differential pressure sticking and provide a low invasion coring fluid. It has been well documented that appropriately formulated Gilsonite products can minimize hole collapse in formations containing water-sensitive, sloughing shales and reduce stuck pipe problems by forming a thin wall cake and an inter-matrix filter cake.

Now it is widely used in water based, oil based, and synthetic based mud systems worldwide.

4.7 PAC-LV :

PAC-LV 70%:	PAC-LV 85%:	PAC-LV 95%:
Product Description		
Purity: 70% Min.	Purity: 85% Min.	Purity: 95% Min.
DS: 0.90 Min.		
pH: 6.5-9.0		
Moisture: 10% Max.		
Apparent viscosity (AV) : 30cps Max.		
Fluid Loss: 16ml Max.	Fluid Loss: 14ml Max.	

4.8 PAC-R:

PAC-R 70%:	PAC-R 85%:	PAC-R 95%:
Product Description		
Purity: 70% Min.	Purity: 85% Min.	Purity: 95% Min.
DS: 0.90 Min.		
pH: 6.5-9.0		
Moisture: 10% Max.		
Apparent viscosity (AV) : 30cps Max.		50 cps Min
Fluid Loss: 26 ml Max.		Fluid Loss: 23 ml Max.

4.9 Partially Hydrolyzing Polyacrylamide (PHPA):

Parameter	Specifications
Appearance	White Crystalline Powder
Solid Content%	90% Min
Hydrolysis Rate,Mol%	30% Max
Molecular Weight	High
Dissolving Time	120Minutes Max

Description

PHPA is a high molecular weight polymer with a moderate anionic charge for drilling mud additive. It can be used in both industrial and oil field drilling application and it is usable in both fresh water and brines.

Application

Shale stabilization
Viscosifier
Friction reduction
Fluid loss control
Lubrication



Method of Addition

To obtain homogeneous solution, efficient dispersion is necessary. The most convenient method of dispersing these products is with a polymer eductor or a commercially available dry powder feeder unit. Solution should be made up at 0.1 - 0.3% solid. Make-up water temperature should be between 10 and 48°C _for optimum product performance. Following dispersion into agitated water, stirring should continue for about an hour to ensure complete dissolution. Stirring maybe carried out by propeller type stirrer with a speed of 200 - 500rpm. It is recommended to have both a stock make-up tank and a solution holding tank for dosage into the system. The above recommended anionic solution concentration are stable for up to one week. Aluminum, zinc, copper, or iron should be avoided in make-up system.

4.10 Xanthan Gum:

Parameter	Specifications
Appearance	Cream-white powder
Particle size (mesh)	Client need(80/200 mesh)
Loss on drying (%)	6-16
Ashes (%)	≤13
Viscosity (1% kcl, cps)	>1200mpa.s
Ph	6.0-8.0
Shearing ratio	≥6.0

Rheologic Measurement

Rate	600rpm	300rpm	200rpm	100rpm	6rpm	3rpm
Standard	75-110	55-120	45-100	35-90	15-40	12.5-35

Description

Xanthan Gum, which is mainly made from starch, is a high molecular weight polysaccharide produced by fermentation with *Xanthomonas Campestris* under the conditions of special nutrient medium, PH, O₂-supply and temperature, the purified, dried and milled into white-like or light-yellow free-flowing powder.

Xanthan Gum can be widely used in more than twenty industrial fields, such as food pharmaceutical, fine chemical, agriculture, oil drilling, and so on. Comparing with other kinds of gum, xanthan gum has many advantages.

1. Outstanding viscosity-enhancing property and solubility in water.
2. Unique pseudo-plasticity rheological property of xanthan gum makes it high-efficient emulsifier and stabilizer.
3. Excellent stability to large range of temperature and PH change.
4. Stable compatibility with acid, alkaline, brine, enzyme, surface active agent, antiseptic, oxidant and other thickener.
5. Perfect synergistic action when compounding with guar gum, locust bean gum and other gums.

Application

Acting as an thickener and stabilizer, Industrial Grade Xanthan Gum can be applied to many industrial fields, such as oil drilling, pesticide, pottery & porcelain, printing & dyeing, paint, paper-making, mine-extraction, and so on. It is specially produced as mud additive for oil drilling. Being an environment friendly and high efficiency mud additive, it has an excellent tolerance to a wide range of temperature, PH and salinity. It can extremely increase the mud penetrative rate and suspension ability to the drilling-cuttings. Meanwhile, it can also reduce the pressure loss during drilling, stabilize the well-bore, prevent the damage to oil formation, and improve the efficiency of drilling, work-over and completion.



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