CONTACT US

WELLDONE CHEMICAL GROUP

Logistics Park Phase-3,Kizad,Abudhabi,UAE

+971 54 998 5259 / 024482961

Email: info@welldonechemical.ae

Website: www.welldonechemical.com

PETROLEUM CHEMICALS SERIES

WELLDONE

WELLDONE CHEMICAL GROUP

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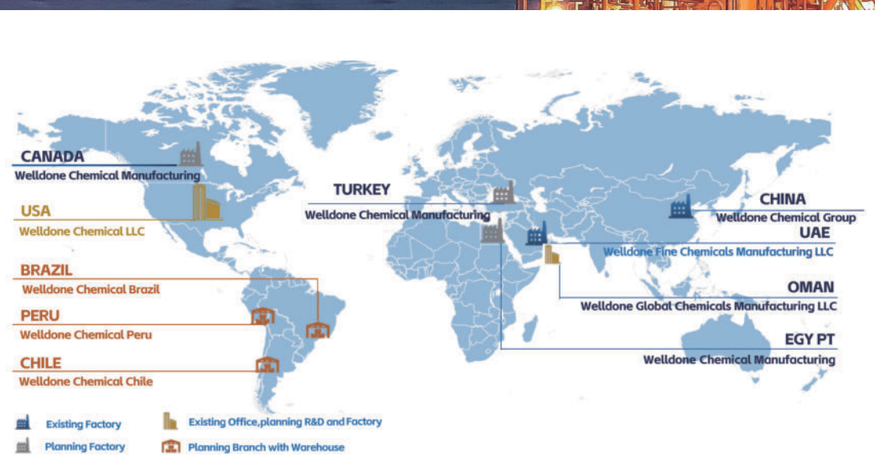


DRILLING FLUIDS AND COMPLETION FLUIDS

OIL PRODUCTION AND TRANSPORTATION

PROFILE AND FRACTURING

PanLube EP

EP Lubricant

Product Description

PanLube EP is one of lubricants used in the high-density water based mud to reduce the torque and drag, provide good lubricity properties and auxiliary to reduce the filtration loss.

Physical property	Treatment
Appearance: brown to dark liquid **Specific Gravity:** 0.95sg	2-4% in the water mud system or as needed

Package

55gal/drum (180kg/drum)

Function and Application

- Temperature tolerance up to 200 degrees C
- Reduce torque and drag
- Good to drill well of ERD and slide drilling
- Auxiliary to reduce filtration loss
- Minimize the metallic wear

PanXan

Viscosifier

Product Description

PanXan is the biopolymer of powder which is produced with the fermentation by bacteria. It is called Xanthan Gum in the oil and gas industry and widely used in the drilling fluids or completion fluids or water. PanZan has excellent shearing thinning character to the rheology.

Physical property	Treatment
Appearance: white and yellow powder **Specific Gravity:** 1.6 **pH Value:** 6 - 7	0.3-5.7kg/m3 in the water mud system or the completion fluids or as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Viscosifier
- Suspension
- Mixed in the fresh water, sea water, and brines.
- Temperature tolerant to 120 degrees C
- Biodegradable and gel broken down by oxidization
- Dispersable Minimize the pay zone damage

PanXan PLUS

Viscosifier

Product Description

PanXan PLUS is the biopolymer of powder which is produced with the fermentation by bacteria. It is called Xanthan Gum in the oil and gas industry and widely used in the drilling fluids or completion fluids or water;Compared with PanXan, PanXan Plus features higher purity and better temperature resistance, and has excellent shearing thinning character to the rheology.

Physical property

Appearance: white and yellow powder
Specific Gravity: 1.6
pH Value: 6 - 7

Treatment

- 0.3-6kg/m3 in the water-based drilling fluid system or tcompletion fluids
- EOR, as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Viscosifier
- Suspension
- Mixed in the fresh water, sea water, and brines.
- Temperature tolerant to 120 degrees C
- Biodegradable and gel broken down by oxidization
- Dispersable Minimize the pay zone damage

PanXan SUPER

Viscosifier

Product Description

PanXan SUPER is the biopolymer of powder which is produced with the fermentation by bacteria. It is called Xanthan Gum in the oil and gas industry and widely used in the drilling fluids or completion fluids or water. Compared with PanXan and PanXan Plus features higher purity better temperature resistance and wide adaptability（reservoir formations and complex intervals）,and has excellent shearing thinning character to the rheology.

Physical property

Appearance: white and yellow powder
Specific Gravity: 1.5
pH Value: 6 - 7

Treatment

- 0.3-6kg/m³ in the water mud system or the completion fluids
- EOR, as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Viscosifier and Suspension
- High purity & low residue
- Applied for fresh water, salt water and low-concentration formate systems.
- Temperature tolerant up to above 150°C
- Excellent rheology control capability
- Easy dissolution without "fish eye”
- Environmental friendliness & safety

PanPAC HV

Filtration control

Product Description

PanPAC HV is the high molecular weight of polyanionic cellulose which is used to control filtration loss in the WBM. It also plays the auxiliary role of increasing viscosity.

Physical property

Appearance: white and yellow powder
Bulk density: 641-881kg/m³
pH Value: 8

Treatment

1.43-5.71kg/m³ in the water mud system or as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Reduce the fluids loss
- Suppress the cutting or clay to swell or disperse
- Thermal stability up to 149 degrees C
- Environment friendly

PanPAC LV

Filtration control

Product Description

PanPAC LV is the polyanionic cellulose which is used to control filtration loss in the WBM. It also plays the auxiliary role of reducing viscosity with a small amount of addition in the salty WBM.

Physical property

Appearance: white powder
Bulk density: 641-881kg/m³
pH Value: 7.75

Treatment

1.43-8.56kg/m³ in the water mud system or as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Reduce the fluids loss
- Suppress the cutting or clay to swell or disperse
- Basically not increase the viscosity
- Thermal stability up to 149 degrees C
- Environment friendly

Pan Sta

Filtration Control

Product Description

As one of the modified starch, **Pan Sta** is the derive of the starch, which is used to control the filtration loss in the WBM. It is definitely environment friendly and will basically not increase the viscosity of the mud. It is tolerant to the bacteria.

Physical property

Appearance: offwhite powder
pH Value: 11.5

Treatment

2.86-14.27kg/m³ in the water mud system or as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Temperature tolerance up to 149 degrees C
- Effectively reduce the fluid loss
- To help prevent the cuttings or clay from dispersing
- No fermentation reaction and no bactericide to mix
- Can be tolerant to salinity, calcium ionic, and high pH value

PanSta HT

Filtration Control

Product Description

PanSta HT is the biopolymer of powder which is produced from starch with the fermentation by special bacteria. It has more superior properties, like used in much higher temperature and higher salinity including divalent cations.In the oil and gas industry it is widely used in the drilling fluids or EOR. PanSta HT has excellent shearing thinning character to the rheology.

Physical property

Appearance: white powder
Specific Gravity: 1.5

Treatment

- 2-14kg/m³in the water-based drilling fluidsystem or completion fluids .
- EOR, as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Reduce filtration loss
- Suitable for the fresh water, sea water, and brines with high salinity
- pH stability and tolerance of divalent cations such as Ca2+, Mg2+
- Higher temperature tolerant up to 140°C , and thermal stability can reach up to 165°Cin potassium formate system
- Biodegradable and gel broken down by oxidization
- Dispersable and water soluble
- Minimize the pay zone damage
  Environment friendly

PanHydraBind

Shale Stabilizer

Product Description

As the form of powder, **PanHydraBind** is the partial hydrated PAM which is used to stabilize the shale and active clay. It can prevent the clay or cuttings from disperse and meanwhile provide lubricity and filtration control as well. The system viscosity can be increased rapidly by PanPlus DPowing to the high molecular weight. It can be soluble in water and salinity and can be mixed in the solid free WBM.

Physical property

Appearance: white powder
Specific Gravity: 1.05
pH Value: 7.0

Treatment

0.70 - 4.5kg/m³ in the water mud system through the hopper to avoid the fisheye.

Package

- 25kg/sack
- Dampproof

Function and Application

Stabilize the water sensitive formation
Flocculent the clay and settling
Increase the lubricity and help to control filtration
Minimize the bit balling
Increase the liquid flow properties or rheology
Enhance or helpful for the bentonite
No fermentation, no bactericide in the mud system

PanHydraBind PLUS

Shale Stabilizer

Product Description

As the form of emulsion, **PanHydraBind Plus** is the partial hydrated PAM which is used to stabilize the shale and active clay. It can prevent the clay or cuttings from disperse and meanwhile provide lubricity and filtration control as well. The system viscosity can be increased rapidly by PanHydraBind owing to the high molecular weight. It can be soluble in water and salinity and can be mixed in the solid free WBM.

Physical property

Appearance: milk white liquid with little flocculation
Specific Gravity: 1.05
pH Value: 7.0
Flash point: 93 degrees C

Treatment

3.0-11.5kg/m³ in the water mud system or as needed

Package

5gal/pail

Function and Application

- Flocculent the clay and settling
- Increase the lubricity and help to control filtration
- Minimize the bit balling
- Increase the liquid flow properties or rheology
- Enhancement or helpful for the bentonite
- No fermentation in the system
- No bactericide to be mixed together in the mud system

PanSeal

Shale Stabilizer

Product Description

PanSeal is one kind of very special amine product, whose molecular weight is low. As a shaleinhibitor, it acts to prevent clay from hydration and swelling. The inhibitor can be embedded intothe clay lattice and block the water molecular into the clay. The mud dilution is minimized.

Physical property

Appearance: white powder
Specific Gravity:1.05
pH Value: 7.0

Treatment

0.70 – 4.5kg/m³ in the water mud system through the hopper to avoid the fisheye.

Package

- 25kg/sack
- Dampproof

Function and Application

- Stabilize the water sensitive formation
- Flocculent the clay and settling
- Increase the lubricity and help to control filtration
- Minimize the bit balling
- Increase the liquid flow properties or rheology
- Enhance or helpful for the bentonite
- No fermentation, no bactericide in the mud system

PanPolyG

Shale Inhibitor

Product Description

PanPolyG is one kind of environment friendly shale inhibitor composed of polymeric alcohol. The water soluble polyglycol can absorb in the surface of the cuttings and wellside to isolate the water and clay surface. The character of "cloud point" will increase liquid viscosity and improve the shale stability. There are three types of PanPolyG as per the cloud points. It depends on the formation temperature.

Physical property

Appearance: brown liquid
Specific Gravity: 1.1sg
Amine Value: 300-450 mg KOH/g

Treatment

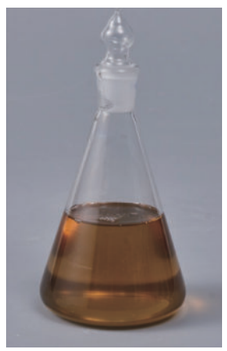
2-3kg/m³ in the water mud system or as needed

Package

55gal/drum (200kg/drum)

Function and Application

- Temperature tolerance up to 200 degrees C
- Superior clay inhibitor
- Enhance lubricity and reduce torque
- Reduce filtration loss
- Improve the mud cake quality
- Stabilize the shale and hole side
- To prevent bit from balling
- Water soluble
- Environment friendly



PanPolyA

Shale Inhibitor

Product Description

PanPolyA Polyether amine is a cationic shale inhibitor belonging to the amine-terminated polyether category. It also possesses multiple functions including fluid loss reduction, rheology regulation, wellbore stabilization, and contamination resistance. As a high-performance, environmentally friendly key treatment agent for water-based drilling fluid systems, it is particularly suitable for shale formations, salt-gypsum formations, and HTHP intervals.

Physical property

Appearance: light yellow transparent liquid
Specific Gravity: 0.98g/cm³
Amine Value: 300-450 mg KOH/g

Treatment

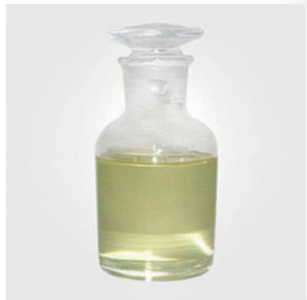
2-4kg/m³ in the water mud system or as needed

Package

55gal/drum (200kg/drum)

Function and Application

- High-efficiency shale inhibitor for
- preventing wellbore collapse
- Fluid loss reducer for improving filter cake quality
- Rheology regulator for improving drilling fluid
- suspension stability
- Anti-contamination agent for alleviating forma-
- tion ion contamination
- Low toxicity and biodegradability, meeting envi-
- ronmental protection requirements



PanSul ASP

Shale Stabilizer

Product Description

PanSul ASP is the high quality sulphonated asphalt, which can be used in various mud systems. It is used to control filtration and prevent the shale from collapse.

Physical property

Appearance: black powder
Specific Gravity:0.98
pH Value: 6-7

Treatment

1 – 4% in the mud system or as needed

Package

- 25kg/sack
- Dampproof, 3-in-1 compound paper bag

Function and Application

- Temperature tolerance up to 200 degrees C
- Effectively reduce the fluid loss
- To prevent the shale from collapse
- To improve the mud cake quality
- To reduce the torque and drag

PanTherm FLW-01

Water-Based DrillingFluid Filtration Control

Product Description

PanTherm FLW-01 is a high temperature polymer fluid loss control agent, and the primary function is to control the HTHP fluid loss. Its temperature resistance can reach 150℃ and above. It is mainly applied in high temperature drilling fluid and completion fluid system. The performance will be better when used in combination with fluid PanTherm FLW-03 and rheology modifier PanRhoMod.

Physical property

Appearance: white powder
Specific Gravity: 1.5g/cm³

Treatment

- 5-21kg/m³ , the specific dosage needs to be determined by small sample test on site to determine the best use concentration
- EOR, as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Applied to high-temperature water-based
- drilling-in fluid and completion fluid systems
- Reducing the HTHP filtration loss
- Temperature resisitance up to 150℃ and above
- Suitable for fresh water, monovalent salt,
- divalent salt and formate systems
- Good solubility

PanTherm FLW-02

Water-Based DrillingFluid Filtration Control

Product Description

PanTherm FLW-02 is a high temperature polymer fluid loss control agent, and the primary function is to control the HTHP fluid loss. Its temperature resistance can reach 180℃ and above. It is mainly applied in high temperature drilling fluid and completion fluid system. The performance will be better when used in combination with fluid PanTherm FLW-04 and rheology modifier PanRhoMod/ viscosifier PanVisc HTW-02.

Physical property

Appearance: white powder
Specific Gravity: 1.6g/cm³

Treatment

- 5-20kg/m³ , the specific dosage needs to be determined by small sample test on site to determine the best use concentration
- EOR, as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Applied to high-temperature water-baseddrill-ing-in fluid and completion fluid systems,auxiliary viscosification.
- Reducing the HTHP filtration loss
- Temperature resisitance up to 180℃ and above
- Suitable for fresh water, monovalent salt, divalent salt and formate systems
- Assists in rheology adjustment.

PanTherm FLW-03

Water-Based DrillingFluid Filtration Control

Product Description

PanTherm FLW-03 is a high temperature polymer fluid loss control agent, and the primary function is to control the HTHP fluid loss. Its temperature resistance can reach 200℃ and above. It is mainly applied in high temperature drilling fluid and completion fluid system. The performance will be better when used in combination with fluid PanTherm FLW-04 and rheology modifier PanRhoMod.

Physical property

Appearance: white or Pale yellow powder

Specific Gravity: 1.6g/cm³

Treatment

- 5-20kg/m³ , the specific dosage needs to be determined by small sample test on site to determine the best use concentration
- EOR, as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Applied in water-based drilling-in and completion fluid systems (clay or clay-free) for deep wells, ultra-deep wells and high-salinity wells.
- Suitable for fresh water, salt water, saturated salt water and formate systems.
- Temperature resisitance up to 200℃ and above
- Wide application range and good compatibility

PanTherm FLW-04

Water-Based DrillingFluid Filtration Control

Product Description

PanTherm FLW-04 is a white copolymer-type fluid loss reducer, whose primary function is to control high-temperature high-pressure (HTHP) fluid loss. Its temperature resistance can reach 220℃ and above, and it is mainly applied in drilling-in and completion fluid systems for deep wells, ultra-deep wells and high-salinity wells. The performance will be better when used in combination with rheology modifier PanRhoMod and viscosifier PanVisc HTW-02.

Physical property

Appearance: white or Pale yellow powder

Specific Gravity: 1.6g/cm³

Treatment

- 4-15kg/m³ , the specific dosage needs to be determined by small sample test on site to determine the best use concentration
- EOR, as needed

Package

- 25kg/sack
- Dampproof

Function and Application

- Applied in water-based drilling-in and completion fluid systems (Clay-free or clay) for deep wells, ultra-deep wells and high-salinity wells.
- Suitable for fresh water, salt water, saturated salt water and formate systems.
- Temperature resisitance up to 220℃
  Improves filter cake quality and effectively reduces high-temperature high-pressure (HTHP) fluid loss.
- Wide application range and good compatibility

PanVisc HTW-01

Water-Based Drilling Fluid viscosifier

Product Description

PanVisc HTW-01 is a high-temperature resistant polymer-type white powder viscosifier , with a temperature resistance of 150°C and above, mainly applied in high-temperature drilling fluid systems. It delivers better performance when used in combination with fluid loss reducers PanTherm FLW-01/PanTherm FLW-02; and achieves superior high-temperature resistance up to 180°C when compounded with PanTherm FLW-03/PanTherm FLW-04.

Physical property	Treatment
Appearance: white powder **Specific Gravity:** 1.7g/cm³	• 1.5-5kg/m³ , the specific dosage needs to be determined by small sample test on site to determine the best use concentration • EOR, as needed

Package

• 25kg/sack • Dampproof

Function and Application

- Applied in water-based drilling fluid systems.
- Suitable for fresh water, monovalent salt and formate systems
- Temperature resisitance up to 150°C or up.
- Improves viscosity and shear force at low shear rate, and enhances hole cleaning performance.
- Improves temperature resistance and suspension stability of the system

PanVisc HTW-02

Water-Based Drilling Fluid viscosifier

Product Description

PanVisc HTW-02 is a high-temperature resistant polymer-type white powder viscosifier , with a temperature resistance of 200°C and above, mainly applied in high-temperature and ultra-high-temperature drilling fluid and completion fluid systems. It can be used in clay-freesystems when combined with fluid loss reducer PanTherm FLW-02 and rheology modifier PanRhoMod; when used with PanTherm FLW-04 and PanRhoMod in formate systems, it delivers superior temperature resistance up to 230°C and above.

Physical property	Treatment
Appearance: white powder **Specific Gravity:** 1.25g/cm³	• 1.5-3.5kg/m³ , the specific dosage needs to be determined by small sample test on site to determine the best use concentration • EOR, as needed

Package

• 25kg/sack • Dampproof

Function and Application

- Applied in high & ultra-high temperature water-based clay-containing and clay-free drilling fluid & completion fluid systems.
- Suitable for fresh water, salt water and formate systems
- Temperature resisitance up to 200°C or up.
- Improves rheology at low shear rate and hole cleaning performance
- Enhances temperature resistance and suspension stability of the system.

PanRhoMod

Water-Based Drilling Fluid Rheology Modifier

Product Description

PanRhoMod is a high-temperature resistant polymer-type liquid rheology modifier , with fluid loss reduction performance, and its temperature resistance reaches 210°C and above. It is mainly applied in high-temperature and ultra-high-temperature drilling fluid and completion fluid systems. It delivers better performance when used in combination with fluid loss reducers PanTherm FLW-03/PanTherm FLW-04, with temperature resistance up to 220°C; when used with PanTherm FLW-04 and PanRhoMod in formate systems, its temperature resistance can reach 230°C and above.

Physical property	Treatment
Appearance: milky white liquid **Specific Gravity:** 1.1g/cm³	• 1.5-6kg/m³ , the specific dosage needs to be determined by small sample test on site to determine the best use concentration • EOR, as needed

Package

55gal/drum

Function and Application

- Applied in high & ultra-high temperature water-based clay-containing and clay-free drilling fluid & completion fluid systems.
- Suitable for fresh water, salt water and formate systems
- Temperature resisitance up to 210°C or up; Enhances temperature resistance and suspension stability of the system
- Improves rheology at low shear rate, and also provides excellent high-temperature high-pressure fluid loss control and lubrication performance

PanThin HTW

Water-Based Drilling Fluid Thinner

Product Description

PanThin HTW is an amber high-temperature resistant thinner with a temperature resistance of 220°C and above. It is mainly applied in drilling fluid and completion fluid systems for deep wells, ultra-deep wells and high salinity formations, featuring strong contamination resistance and excellent compatibility with other additives.

Physical property	Treatment
Appearance: amber liquid **Specific Gravity:** 1.02g/cm³	• 1.5-3.5kg/m³ , the specific dosage needs to be determined by small sample test on site to determine the best use concentration • EOR, as needed

Package

55gal/drum

Function and Application

- Applied in water-based clay-containing and clay-free drilling fluid & completion fluid systems for deep wells, ultra-deep wells and high salinity formations.
- Suitable for fresh water, salt water and saturated salt water systems.
- Temperature resisitance up to 220°C or up; wide application range and excellent compatibility;Strong contamination resistance.
- Effectively optimizes drilling fluid viscosity and yield point, improving flowability.
- Environmentally friendly product with low dosage requirement.

DRILLING FLUIDS AND COMPLETION FLUIDS

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PanPPD

Pourpointdepressant

Product Description

PanPPD is a pour point depressant (PPD) for crude-oil gathering and pipeline transportation. It modifies wax crystallization, lowering pour point, gel strength, and low-temperature viscosity so the crude flows freely at lower temperatures.

Physical property

Appearance: Colorless liquid
Density(20,g/cm³) : 0.850~1.000
Freezing point decreasing scale: ≥10

Treatment

As needed

Package

200l/drum or IBC

Function and Application

- Suitable for both pour-point (freezing point) depression and viscosity reduction during long-haul transportation of paraffinbase crude oils
- Decreases reliance on line heating and intermediate pumping stations by improving cold-flow behavior
- Reduces steady-state backpressure and restart pressure after shut-ins, enabling smoother restarts and potential throughput gains

PanDem

Crude oil demulsifier

Product Description

PanDem is a formulated water-in-oil (W/O) demulsifier designed to separate produced water from crude oil. The active package is a phenolic-resin-polyether copolymer (controlled chain-opening and end-capping) blended with demulsification synergists to accelerate droplet coalescence. The result is fast water drop growth, high dehydration rate, bright oil, and improved effluent-water clarity. Suitable for heater-treater and electrostatic desalting service; dosage optimized by bottle tests for each crude.

Physical property

Appearance: Between yellow and brown-red
Density (20): 0.900 ~ 1.100 g/cm³
Freezing point: > -25
Kinetic viscosity (25℃): mPa•s≤500
Flash point (closed cup): ≥62

Treatment

As needed

Package

200l/drum or IBC

Function and Application

- Demulsification of crude oil
- Dehydration and desalting of crude oil

PanRdem

Reverse demulsifier

Product Description

PanRdem is an oil-in-water demulsifier that separates dispersed oil from produced water. It promotes rapid droplet coalescence, delivering recoverable oil and cleaner water for downstream treatment or discharge. Effective at low ppm dosages and compatible with hydrocyclones, IGF/DGF units, and separators.- Formulated from phenolic-resin/polyether actives with synergists for fast dehydration and bright effluent.

Physical property

Appearance: between yellow and brown-red
Density (20 , g/cm3): ≥0.900
Freezing point: ≤-5
Kinetic viscosity (25°C): mPa•s≤ 100

Treatment

As needed

Package

200l/drum or IBC

Function and Application

- To treat the producing water in the oilfield, separate the oil from the water.
- To treat the sewage water in the refinery, separate the oil from the water.

Bacteriacide

Product Description

It contains quaternary amine salts, aldehydes, surfactants, penetrants and other components, can effectively inhibit bacterial growth, its penetrants can also effectively penetrate into the scale, hinder the scale bacteria such as sulfate reducing bacteria growth and reproduction, inhibit corrosion.

Physical property

Appearance: Light yellow or red-dish brown uniform transparent liquid
Freezing point: ≤ -10℃

Treatment

50-150 ppm by the concentration

Package

25kg/pail

Function and Application

- Used in the drilling fluids, completion fluids, workover fluids, oilfield production to inhibit corrosion and as a bacteriacide.

Technical team

Senior oilfield on-site fracturing engineer, oilfield chemical engineer, and polymer material synthesis expert.

Fracturing fluid products

PAM products-dry powder PAM

01/Instant PAM products

Product introduction:
This product is developed and mixed to adapt to fracturing on site therefore the high effective content of emulsions and suspensions is promised. The biggest feature is its fast dissolution speed, which is especially suitable for on-site quick-mixing requirements and large-scale well factory fracturing operations.

Usage:
◆On-site quick-mixing fracturing modification;
◆Repeated fracturing modification of conventional oil and gas wells;
◆Fracturing modification of tight oil and gas reservoirs;
◆Large-scale fracturing modification of shale gas reservoirs;
◆Factory-scale large-scale fracturing modification;
◆Reservoir fracturing modification of coal bed methane reservoirs.

02/Salt-resistant PAM products

Product introduction:
Anti-salt monomer are added through a special procedure to polymerize to form ultra-fine particles that quickly dissolve in water and continuously form a network structure. It is very suitable for on-site flowback liquid recycling, purified water dispensing construction at crude oil processing station, and dispensing construction of river and lake water, other surface water and high salinity water .
Advantage:
Strong shear resistance, deformation resistance, salt resistance, and high drag reduction rate.

03/Hydrophobically associated PAM products

Product introduction:
By introducing sulfonic acid salt-resistant monomers and macromolecular hydrophobic monomers into polyacrylamide monomers, this product can change the linear molecular structure, improves salt-resistant and temperature-resistant properties. The fracturing fluid system can meet the technical requirements for seawater fracturing fluid preparation and foam fracturing. In addition, this product can be used as a slick water drag reducing agent for volume fracturing.
Advantage:
◆ Stable performance and long storage time;
◆Strong adaptability and low requirements for the quality of clean water used in the preparation of liquids;
◆The viscosity is adjustable;
◆Low friction, resistance reduction rate of more than 75%;
◆ Good sand carrying performance and good viscoelasticity;
◆Temperature-resistant and shear-resistant, the viscosity has a self-restoring function;
◆Clean and low-damage, with less impurities and less damage to the reservoir;
◆Easy to flow back and the glue will break quickly after pressing;
◆Easy liquid preparation and fast gel formation, suitable for on site mixing;

Fracturing fluid products

PAM products-Emulsion PAM

Product introduction:
Polyacrylamide (PAM) uses oil as the capsule phase and water soluble polymer is dispersed in the oil in the form of microspheres. It is produced by inverse emulsion polymerization.
Advantage:
◆Stable performance and long storage time;
◆Fast sticking speed;
◆The viscosity of the clean water solution is high;
◆High drag reduction rate;
◆Low damage;
◆The liquid preparation is simple and suitable for on site mixing.

Hydrophilic PAM suspension

This product is developed to overcome the problem that the oil phase in oil-based suspension easily emulsifies with the formation. It replaces the oil phase in oil-based suspension with a hydrophilic solvent. Its performance indicators are similar to those of oil-based suspension.
Advantage:
◆Dissolution speed is fast;
◆The liquid preparation has no fish eyes and the solvent effect is good;
◆Stable storage performance;
◆One dose can be used for multiple purposes during on-site construction;
◆Low formation damage.

Fracturing fluid products

Fracturing fluid system additives

01/Instant PAM products

Product introduction:
This product is divided into two types: alkaline cross-linking and acidic cross-linking. Alkaline cross-linking organic zirconium is made by complexing inorganic zirconium with a complexing agent under certain conditions; acidic cross-linked organic zirconium is formed by complexing organic zirconium with inorganic zirconium under certain conditions, and it forms fracturing fluid jelly by cross-linking reaction with polyacrylamide derivatives under weak acid conditions.
Advantage:
◆High temperature resistance;
◆The cross-linking time is controllable;
◆High cross-linking strength.

02/Drainage aid for fracturing

Product introduction:
This product is used in fracturing fluid and has good compatibility with other additives in fracturing fluid. It can prevent formation pollution, and reduce oil layer damage. , has the advantages of good wettability, high thermal stability, and easy construction and use.
Advantage:
◆It can effectively reduce the surface tension and interfacial tension of the fracturing gel breaker fluid.
◆High flowback rate of fracturing fluid.
◆ Low formation damage.

03/Clay stabilizer for fracturing

Product introduction:
This product can effectively adsorb on the surface of clay, prevent the expansion and migration of water-sensitive minerals, reduce the damage of water-based fracturing fluid to oil and gas layers, and resist the erosion of acid, salt, alkali and oil and water. It is effective for a long time and is suitable for fracturing. Fracturing fluid, activated water, perforating fluid and other working fluids entering the well.
Advantage:
◆Wide scope of application;
◆Effectively inhibit clay expansion.

04/Emulsification inhibitor

Product introduction:
The working fluid passes through the reservoir and forms an emulsion with the crude oil in the reservoir, causing emulsification damage, resulting in a decrease in reservoir permeability, affecting the flowback speed of the well fluid and the oil well production. This product can effectively prevent and eliminate the formation of emulsion in the formation by the well fluid. liquid, effectively increasing the flowback speed.
Advantage:
◆Strong ability to inhibit the formation of emulsion;
◆Effectively increase the flowback speed.

05/Low temperature gel breaking system

Product introduction:
The low-temperature gel breaker system is composed of low-temperature gel breaker and a low-temperature activator, which enables the fracturing fluid to completely break the gel at low temperatures (<30℃). It is low-cost, easy to operate, has good stability, and does not harm human body and pollute environment.
Advantage:
◆Strong gel breaking ability;
◆Suitable for low temperature conditions.

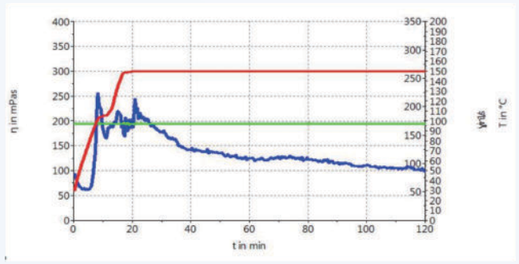
Fracturing fluid system

High temperature resistant polymer cross-linking fracturing fluid

◆Suitable for the reservoirs at 120 -180℃.

◆Use the polymer thickener with the organic zirconium crosslinking agent.

Additives	Amounts
Water	900 kg/m3
Thickener	5.0 kg/m3
Clay stabilizer	3.0 L/m3
Drainage aid	2.0 L/m3
Demulsifier	1.0 L/m3
Organic zirconium	10.0 L/m3
Gel Breaker	1.5 kg/m3



Emulsion/ slurry on-site direct mixing integrated fracturing fluid

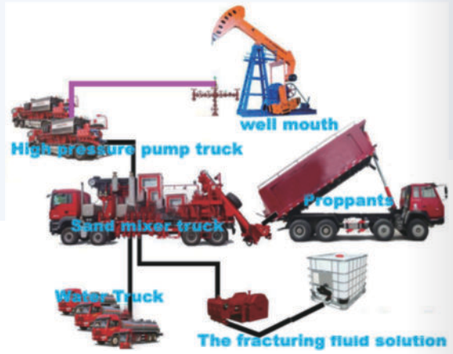
◆Suitable for the unconventional reservoirs like the shale gas and the coalbed methane.

◆On-site mixing of the low, medium and high viscosity fracturing fluid.

◆The base liquid viscosity of the emulsion direct mixing integrated system is adjustable and the dissolution time is short.

◆The fracturing fluid can be cross-linked and hung for 40 to 80 seconds.

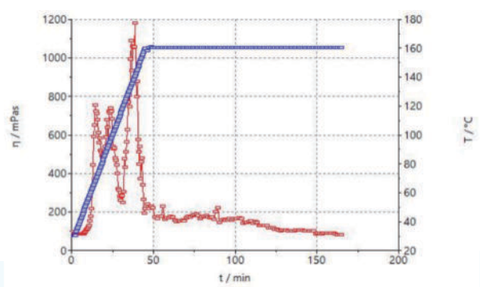
◆The gel can be broken completely in 2 hours.



Fracturing fluid based on seawater

◆Suitable for the seawater with the greater than 50000ppm salinity.

◆High temperature resistant, more than 160℃.



Fracturing fluid system

Fracturing fluid from repreparing the flowback fluid

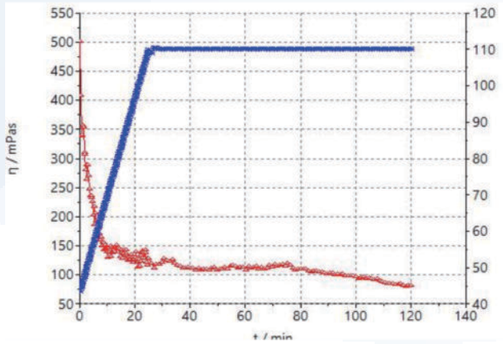
◆Fracturing flowback fluid working as the preparation water.

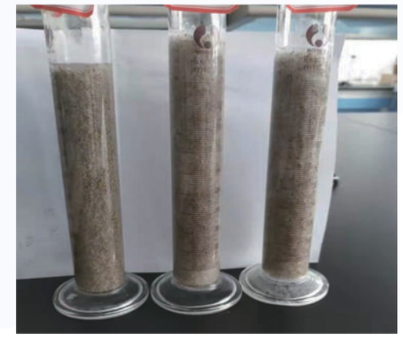
◆High salinity resistant, up to 20000ppm.

◆High crosslinking strength and high sands carrying ratio.

◆The controllable thorough gel breaking time and the low residue contents.

Additives	Amounts
Thickener	2.5 kg/m³
Drainage aid	1.0 L/m³
Crosslinking Agent	6.5 L/m³
Gel Breaker	0.5 kg/m³





Dry powders onsite mixing fracturing fluid

◆Rapid dissolving dry polymer powders.

◆Suitable for the different water preparations.

◆Mixing and instant dissolving equiment.

◆High concentration 2%-5% of the prepared solution, which can meet the needs of high-ratio fracturing fluid preparation for flowback fluid, and can be flexibly adjusted according to actual needs (viscosity change, cross-linking, water quality adjustment, etc.)

Welldone Chemical Group

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