Product Data Sheets

HALLIBURTON | Baroid

Engineered fluid solutions customized to maximize wellbore value.

ADAPTA®

FILTRATION CONTROL ADDITIVE AND VISCOSIFIER

Product Description

ADAPTA® filtration control additive and viscosifier is a cross-linked polymer that can provide filtration control in all non-aqueous fluid (NAF) systems up to about 425°F (218°C). It also functions to build viscosity, suspension and emulsion stability as a key component of organophilic clay-free invert emulsion fluids. ADAPTA filtration control additive and viscosifier is suitable for use in fluids designed for deepwater applications.

Applications/Functions

- Can reduce high pressure/high temperature (HPHT) filtrate in all NAF systems
- Can provide secondary viscosity, suspension, and emulsion stability

Advantages

- Is an extremely effective HPHT filtrate reducer in concentrations as low as 0.5-4.0 lb/bbl (1.4-11.4 kg/m³)
- Easily mixed in dry form through the hopper with rapid results
- Promotes fluid gel strength and rheological profiles which exhibit low surge and swab pressures
- Allows formulation of deep-water fluids with excellent low temperature rheological profiles

Typical Properties

- Appearance: Off-white powder
- Specific Gravity: 1.03

Recommended Treatment

- Add 1.5-4.0 lb/bbl (4.3-11.4 kg/m³) up to 350°F (177°C)
- Add 4.0-6.0 lb/bbl (11.4-17.1 kg/m³) to increase rheological properties, or for higher HPHT temperatures
- Note – Product solubility and dispersion capability varies with temperature and base fluid selection.

Packaging

ADAPTA filtration control additive is packaged in 55.1-lb (25-kg) bags.

ADAPTA® 450

FILTRATION CONTROL AGENT

Product Description

ADAPTA® 450 filtration control agent is a cross-linked polymer that can provide filtration control in oil and synthetic based fluid systems at temperatures up to 450°F (232°C). This product is very similar to ADAPTA filtration control agent, but typically provides lower fluid loss and less plastic viscosity contribution at temperatures above 350°F (177°C). ADAPTA 450 filtration control agent is most compatible with medium and high polarity base oils. ADAPTA 450 filtration control agent can be used as a single fluid loss agent or in conjunction with black powders depending on the fluid system.

Applications/Functions

- Reduces HPHT filtrate volumes in all oil and synthetic mud systems in temperatures ranges up to 450°F (232°C).

Advantages

- Maintains fluid loss control at much higher temperature limits than LIQUITONE® or ADAPTA filtration control agents
- Is extremely effective HPHT filtrate reducer in concentrations as low as 2.0 to 6.0 lb/bbl (5.7-17.1 kg/m³)
- Allows formulation of deep-water fluids with excellent low temperature tolerance
- Imparts less viscosity than other copolymer filtration control additives

Typical Properties

- Appearance: Off-white solid powder
- Specific gravity: 1.03
- Solubility: Oil dispersible

Recommended Treatment

- Add 2.0 to 6.0 lb/bbl (5.7-17.1 kg/m³) for HPHT filtration control up to 450°F (232°C).

Packaging

ADAPTA 450 filtration control agent is packaged in bulk and 55.1- lb (25-kg) bags.

AKTAFLO®-S™

WETTING AGENT

Product Description

AKTAFLO®-S™ wetting agent is a liquid surfactant that rapidly alters the surface tension on dispersed particles in water-based drilling fluids leading to lower flow properties of the drilling fluid. AKTAFLO-S wetting agent can also be used to stabilize the flow properties and gel strengths of water-based drilling fluids exposed to high temperatures. Small concentrations of AKTAFLO-S wetting agent are typical in land-based drilling applications.

Applications/Functions

- Stabilize rheological and filtration properties
- Prepare surfactant drilling fluids such as lignite/surfactant, calcium/surfactant, and salt water/surfactant
- Emulsify oil in water

Advantages

- Helps reduce high-temperature filtration and rheological characteristics.
- Is compatible with all water-based systems
- Exhibits thermal stability in excess of 400°F (205°C)
- Helps reduce bit balling and the potential for differential sticking
- Helps increase solids tolerance for water-based systems

Typical Properties

Appearance:	Clear to slightly colored liquid
Specific Gravity:	1.097
Flash point:	>215°F (102°C)

Recommended Treatment

To emulsify oil into water, add 0.5-7.0 lb/bbl (1.4-20.0 kg/m³).

As a wetting agent, add 0.5-3.0 lb/bbl (1.4-8.5 kg/m³).

Packaging

AKTAFLO-S wetting agent is packaged in 5-gal (18.9-l) cans and 55-gal (208-l) drums.

ALDACIDE® G

BIOCIDE

Product Description

ALDACIDE® G biocide is suitable for use in water-based drilling fluids and packer fluids. ALDACIDE G biocide is effective against aerobic and anaerobic bacteria and is compatible with all brine types. Use of ALDACIDE G biocide in conjunction with sulphite oxygen scavengers is not recommended.

Applications/Functions

- Water-based drilling fluids
- Completion and packer fluids
- Aqueous waste treatment
- Used as part of corrosion control systems

Advantages

- Effective against a broad range of microbes, bacteria and fungi
- Effective in small concentrations
- Compatible with most water-based drilling fluids

Typical Properties

- Appearance: Transparent liquid
- Specific gravity: 1.06
- pH: 3.1 - 4.5

Recommended Treatment

Initial additions around 0.4 lb/bbl (1.1. kg/m^3) will achieve effective antimicrobial action. Packer fluids should be treated with ALDACIDE G along with other corrosion control additives. Circulating fluids require regular additions of ALDACIDE G in order to maintain protection.

Caution: ALDACIDE G biocide is incompatible with BaraScav™ D and BaraScav™ L oxygen scavenges.

Packaging

ALDACIDE G biocide is packaged in 5-gal (18.9-l) pails and 55-gal (208-l) drums.

AQUAGEL®

VISCOSIFIER

Product Description

AQUAGEL® viscosifier is a treated premium grade Bentonite. AQUAGEL viscosifier is finely ground to aid in dispersion and meets API specifications 13A, section 9 requirements. This product can provide viscosity and gelling characteristics to most water-based drilling fluids and also helps reduce fluid loss and filtrate seepage into the formation.

Applications/Functions

- Viscosify anionic water-based drilling fluids
- Can reduce water seepage or filtration into permeable formations
- Can form a thin filter cake with low permeability
- Can promote hole stability in poorly consolidated formations

Advantages

- Helps provide suspension for fluids weighted with barite or hematite
- Helps improve hole-cleaning capacity of drilling fluids
- Meets or exceeds API manufacturing standards (Section 9, Bentonite)
- Is environmentally responsible
- Can be added directly to fresh water or fresh water drilling fluids

Typical Properties

- Appearance: Variable-colored powder
- Bulk density, compacted: 73 lb/ft³ - 1169 kg/m³
- Bulk density, uncompacted: 50 lb/ft³ - 800 kg/m³

Recommended Treatment

- Add AQUAGEL viscosifier in concentrations of 0-25 lb/bbl (0-70 kg/m³) to any active system.
- Mix slowly through a jet mixer or sift slowly into the vortex of a high-speed stirrer.

Note: For optimum yield, AQUAGEL viscosifier should be prehydrated in fresh water when the fluid's chlorides exceed 8000 ppm.

Packaging

AQUAGEL viscosifier is available in 50-lb (22.7-kg) sacks and 100-lb (45.4-kg) sacks.

AQUAGEL GOLD SEAL®

VISCOSIFIER

Product Description

AQUAGEL GOLD SEAL® viscosifier is a premium non-treated Bentonite which meets API specification 13A, section 9 requirements. This product acts primarily as a viscosifier but also aids in filtrate reduction for water-based drilling fluids. AQUAGEL GOLD SEAL viscosifier works best in fresh water-based fluids.

Applications/Functions

- Viscosify anionic water-based drilling fluids
- Reduce water seepage or filtration into permeable formations
- Form a thin filter cake with low permeability
- Promote hole stability in poorly consolidated formations

Advantages

- Can provide suspension for fluids weighted with barite or hematite
- Can improve hole-cleaning capacity of drilling fluids
- Contains no polymer or chemical additives
- Is environmentally responsible
- Can be added directly to fresh water or fresh water drilling fluids
- Can be supplemented with polymeric extenders

Typical Properties

Appearance:	Variable-colored powder
Bulk density, compacted:	73 lb/ft³ - 1169 kg/m³
Bulk density, uncompacted:	50 lb/ft³ - 800 kg/m³

Recommended Treatment

Add AQUAGEL GOLD SEAL viscosifier in concentrations of 5-25 lb/bbl (14-70 kg/m³) slowly through a jet mixer or sift slowly into the vortex of a high speed stirrer. Note: For optimum yield, AQUAGEL GOLD SEAL viscosifier should be prehydrated in fresh water when chlorides will exceed 8000 ppm.

Packaging

AQUAGEL GOLD SEAL viscosifier is available in 50-lb (22.7-kg) sacks and 100-lb (45.4-kg) sacks.

AQUAGEL GOLD SEAL®

VISCOSIFIER

Product Description

AQUAGEL GOLD SEAL® viscosifier is a premium Bentonite that contains no polymer additives. AQUAGEL GOLD SEAL viscosifier meets API specifications 13A, section 9 requirements. This product acts primarily as a viscosifier but also aids in filtrate reduction for water-based drilling fluids. AQUAGEL GOLD SEAL viscosifier works best in fresh water-based fluids.

Applications/Functions

- Viscosify anionic water-based drilling fluids
- Reduce water seepage or filtration into permeable formations
- Form a thin filter cake with low permeability
- Promote hole stability in poorly consolidated formations

Advantages

- Can provide suspension for fluids weighted with barite or hematite
- Can improve hole-cleaning capacity of drilling fluids
- Contains no polymer or chemical additives
- Is environmentally responsible
- Can be added directly to fresh water or fresh water drilling fluids
- Can be supplemented with polymeric extenders

Typical Properties

Appearance:	Variable-colored powder
Bulk density, compacted:	73 lb/ft³ - 1169 kg/m³
Bulk density, uncompacted:	50 lb/ft³ - 800 kg/m³

Recommended Treatment

Add AQUAGEL GOLD SEAL viscosifier in concentrations of 5-25 lb/bbl (14-70 kg/m³) slowly through a jet mixer or sift slowly into the vortex of a high speed stirrer.

Note: For optimum yield, AQUAGEL GOLD SEAL viscosifier should be prehydrated in fresh water when chlorides exceed 8000 ppm.

Packaging

AQUAGEL GOLD SEAL viscosifier is available in 50-lb (22.7-kg) sacks and 100-lb (45.4-kg) sacks.

AQUA-LATE®

BASE FLUID

Product Description

AQUA-LATE® base fluid is a non-aqueous fluid spacer for FUSE-IT® or Thermatek® RSP lost circulation material applications. A non-aqueous spacer is used with FUSE-IT lost circulation material to help ensure that it can be placed in the loss zone before it reacts with water. AQUA-LATE base fluid can be used as a spacer in all operational areas.

Applications/Functions

- It is specifically provided to use as a spacer for FUSE-IT or Thermatek RSP treatments
- It may be used as a spacer for any water based applications

Advantages

- There are minimal HES hazards
- Can be viscosified with 10-12 ppb (28.6-34.3 kg/m³) BARARESIN®-VIS viscosifier as a carrier fluid for LCM additions to a spacer (requires some shear)

Typical Properties

Appearance:	Colorless Liquid
Specific gravity:	0.78
Flash Point:	130° C (266° F)
Kinematic Viscosity:	8.2 max
Solubility:	Oil soluble

Recommended Treatment

- Use at 100% concentration at required volume as base fluid for non-aqueous spacers

Packaging

AQUA-LATE base fluid is available in 13-bbl tanks and 55-gal drums.

AQUATONE-S™

WETTING AGENT

Product Description

AQUATONE-S™ wetting agent is a concentrated liquid surfactant that rapidly alters the surface tension of dispersed particles in water-based drilling fluids leading to lower flow properties. It can also be used to stabilize the gel strengths and flow properties of fluids which are used in high temperature drilling applications.

Applications/Functions

- Helps stabilize rheological and filtration properties
- Improves thermal stability of water-based fluids
- Can reduce or prevent bit balling
- Helps emulsify oil into water-based systems

Advantages

- Compatible with all water-based systems
- Exhibits thermal stability in excess of 400°F (205°C)
- Helps lower plastic viscosity through improved water-wetting
- Reduces the potential for differential sticking

Typical Properties

Appearance:	Clear to slight yellow liquid
Specific Gravity:	1.097
Flash Point:	215°F (102°C)

Recommended Treatment

- As a wetting agent, add 0.5-4.0 lb/bbl (1.4-11.4 kg/m³)
- To help emulsify oil into water, add 0.5-7.0 lb/bbl (1.4-20 kg/m³)

Packaging

AQUATONE-S wetting agent is packaged in 5-gal (18.9-L) pails and 55-gal (208-L) drums.

PRODUCT DATA SHEET

BaraBase® 1

NAF BASE FLUID

Product Description

BaraBase® base fluids are Group III, low aromatic content hydrocarbon-based feedstocks used to build Non-Aqueous Fluid (NAF) systems. The product numbers refer to specific ranges of kinematic viscosity. In this case, BaraBase 1 base fluid exhibits a low viscosity for a wide variety of drilling and completion applications. This contributes to low plastic viscosity in most NAF formulations, meaning this base fluid can enhance drilling performance in projects where a low Equivalent Circulating Density (ECD) fluid is required.

The BaraBase line of base fluids was created to meet a growing need for additional product availability in a number of active drilling basins. While operations have routinely depended on single-sourced base fluids, this can mean higher supply risk and price volatility in today's market. The BaraBase fluids provide advantages through Halliburton's blending expertise and broad sourcing capabilities. This simplifies the process of base fluid selection for the operator, and helps to ensure reliable supply along with superior technical performance.

Applications/Functions

- Used to formulate standard and low-ECD NAF for all drilling and reservoir drilling applications
- Range of viscosity options for different applications
- Freeze protection for wellheads and surface valves

Advantages

- Diverse production network worldwide to minimize lead times and support continual supply
- High flash point
- Low to negligible aromatic content (below detection limits with most analytical equipment)
- Low pour point for applications in arctic climates and deepwater
- Compatible with existing NAF volumes and existing stocks of other Group III base fluids

Properties

Property	Units	Typical values
		BaraBase® 1
Appearance	-	Clear Fluid
Density at 15°C	kg/m^3	790-810
Kinematic Viscosity at 40°C	mm^2/s	1.7
Flash point	°C	79
Aromatic content	wt%	< 0.5%
Aniline point	°C	74

BaraBase® 1

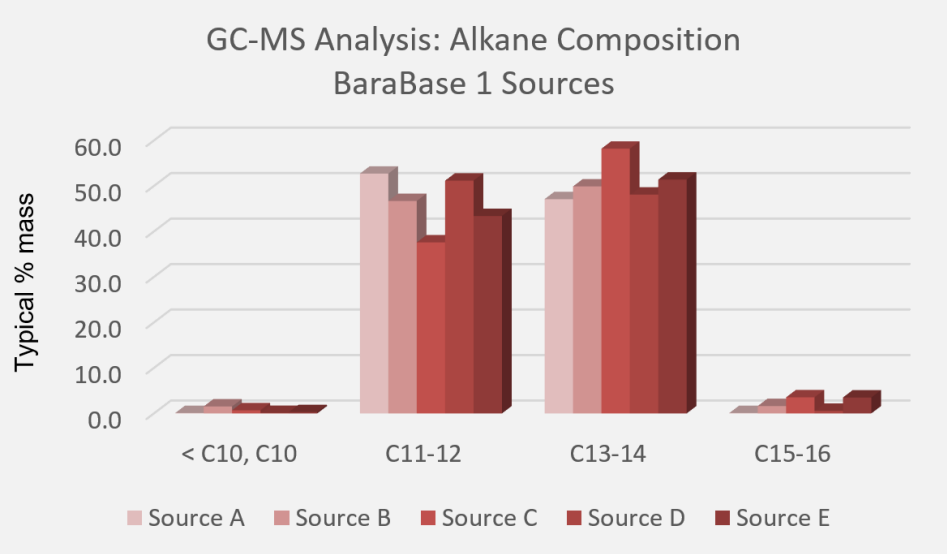
NAF BASE FLUID

Quality Assurance

Approved BaraBase 1 sources must meet Baroid Quality Specifications for their physical properties, and were screened in our Houston Technology Center by Gas Chromatography-Mass Spectroscopy (GC-MS) analysis according to internal SOP 310. This method identifies all of the alkane and aromatic components for each candidate base fluid by comparing their chromatograph results to known chemical standards.

The composition of BaraBase 1 varies slightly by source, yet primarily consists of C11-C14 saturated hydrocarbons which are all suitable for blending. These may include a mixed variety of straight, branched and cyclic structures which have a strong similarity to nearly all traditional Group III base fluids in the market. Additionally, Baroid Laboratories have conducted testing for each source in multiple types of fully formulated NAF. These tests confirmed they provide similar fluid behavior to other single-sourced base fluids.

The below chart and table compare the compositions of five different BaraBase 1 sources.



% wt.	Source A	Source B	Source C	Source D	Source E
< C10, C10	0.1	1.5	0.7	0.1	0.3
C11-12	52.7	46.7	37.6	51.2	43.4
C13-14	47.1	49.9	58.2	48.1	51.4
C15-16	0.1	1.6	3.5	0.6	3.5

BaraBlend™-639

LOST CIRCULATION MATERIAL

Product Description

BaraBlend™-639 lost circulation material (LCM) is finely ground walnut shells used to help combat whole fluid loss of water-based or non-aqueous-based fluids. BaraBlend-639 LCM is designed to have a narrow particle size distribution (PSD), which minimizes the occurrence of pump failures and tool blockages. Its optimal function is observed when used in the active fluid system as a method of prevention of losses due to seepage and/or small fractures.

Applications/Functions

- Helps stop or reduce the occurrence of seepage to partial lost circulation
- Helps remove sticky clays from the bottom hole assembly

Advantages

- Narrow PSD minimizes pump failures and tool blockages
- Granular, tough particulate has low attrition to shear
- Compatible with other LCMs
- Excellent performance in active fluid for prevention of losses

Typical Properties

Appearance:	Fine, granular sized nut shell material
Specific Gravity:	1.20

Recommended Treatment

For best results as prevention of lost circulation, add 10-40 lb/bbl (28.5-114.1 kg/m^3) into active fluid system.

Packaging

BaraBlend-639 lost circulation material is packaged in 50-lb (22.7-kg) sacks.

BaraBlend®-1046

LOST CIRCULATION MATERIAL

Product Description

BaraBlend®-1046 premium granular, high fluid loss lost circulation material (LCM), contains a blend of pre-sized coarse grind walnut hulls. This material can be used in all fluid types and formations, but may not be suitable in all reservoir applications. BaraBlend®-1046 is designed to rapidly seal fractures up to 1,500 microns with high overbalance pressure. BaraBlend-1046 LCM is designed to be used as a remedial LCM treatment which can minimize non-productive time due since it can be pumped through most typical bottom-hole assemblies (BHAs).

Applications/Functions

- Applicable when drilling into partial to severe loss-prone areas at high overbalance
- Mixed into the existing fluid system with minimal effects on properties

Advantages

- Engineered solution that retains large particle size but passes through tools
- Increased rig-floor efficiency:
  - Reduces footprint on rig floor
  - Lowers costs associated with rig time for mixing treatments, excess material inventory and space

Typical Properties

Appearance:	Light brown granules
D100:	Less than 2000 microns (100% passes a US #10 sieve)
Mass thru US #40	10-25%
Specific gravity:	1.2 - 1.4

Recommended Treatment

For sealing fractures and permeable zones up to 1,500 microns, typical concentrations should be around 5-20 lb/bbl. Please consult your local field professionals for guidance with treatments and appropriate solids control equipment.

Packaging

BaraBlend-1046 LCM is packaged in 50 lb (22.7 kg) bags and 2000 lb (907.2 kg) super sacks.

BaraBreak W-1035

INTERNAL FILTERCAKE BREAKER

Product Description

BaraBreak W-1035 is a drill-in fluid additive used to assist in the degradation of starch and other biopolymers present in the filtercake deposited during drilling. BaraBreak W-1035 is a fine, inert particle which, upon contact with a mild acid such as that released by N-FLOW™ 325, becomes activated. The activation process involves oxygen being generated and free radicals being formed which enhance polysaccharide removal. This component is particularly effective at lower reservoir temperatures such as those below 200°F.

Applications/Functions

- Water-based drill-in fluids
- Completion fluids

Advantages

- Assists in complete filtercake removal at reservoir temperatures below 200°F
- Does not require strong acid for activation, therefore reducing the risk of corrosion

Typical Properties

- Appearance: White powder
- Specific gravity: 2.44

Recommended Treatment

Add 1 – 3 lb/bbl to the drill-in fluid and maintain active concentration throughout drilling. Can also be added to any screen-running fluids to replace product lost through mechanical erosion of the filtercake.

Packaging

BaraBreak W-1035 is packaged in 50 lb fiber drums.

BaraBrine™ Defoam

DEFOAMER

Product Description

BaraBrine™ Defoam defoamer can be used to prevent or eliminate existing foam in water-based drilling fluids and brines. BaraBrine™ Defoam defoamer can be used effectively in most water-based fluids and all brine types.

Applications/Functions

- Drilling fluids
- Completion fluids

Advantages

- Effective at small concentrations
- Dispersible in brine
- Compatible with most water-based fluids, including zinc brines
- Can be added directly to the circulating system
- Contains no petroleum hydrocarbons

Typical Properties

- Appearance: Clear liquid
- Specific gravity: 0.91
- Flash point: 320°F (160°C)

Recommended Treatment

Add 0.05 - 0.25 lb/bbl (0.14 - 0.71 kg/m³), 0.007 - 0.033 gal/bbl (0.17-0.79 l/m³) of BaraBrine™ Defoam defoamer directly to the circulating system. BaraBrine™ Defoam can be added before lubricants which may have a foaming tendency.

Packaging

BaraBrine™ Defoam defoamer is packaged in 5-gal (18.9-l) cans and 55-gal (208-l) drums.

BaraBrine® W-1059

SCALE INHIBITOR

Product Description

BaraBrine® W-1059 scale inhibitor is designed to prevent scale deposition in reservoir drilling fluids and completion brines. Mineral scale formation can arise due to incompatibility between native formation fluids and completion brines or drilling fluid filtrates that enter the reservoir pore space. This can cause formation damage if left untreated.

Applications/Functions

- Helps prevent scale formation between formation fluids and completion brine or drilling fluid filtrate
- Compatible with monovalent and divalent brines

Advantages

- Performs at low concentrations
- Water soluble

Typical Properties

- Appearance: Colorless to light amber liquid
- Specific gravity: 1.26 – 1.32
- Flash point: > 200°F (>93.3°C)
- pH: 1.5 – 2.5 (10% in 1:1 IPA/H_2O)

Recommended Treatment

BaraBrine W-1059 is effective at 0.1% v/v concentration in completion brines. Laboratory testing should be performed to tailor the treatment for each specific reservoir.

Packaging

BaraBrine W-1059 scale inhibitor is packaged in 55-gal (208-l) drums.

BaraCap™ -1036

ENCAPSULATOR

Product Description

BaraCap-1036 encapsulator is a modified natural polymer designed to stabilize reactive clays and shale formations in water-based drilling fluids. It prevents cuttings erosion and provides a coating on formations to minimize hydration and washout. BaraCap-1036 is biodegradable and provides secondary filtration control to minimize the hydration of clay-rich formations.

Applications/Functions

- Freshwater, seawater and monovalent brine-based drilling fluids
- Stabilizes cuttings and reduces hydration of water-sensitive shales
- Provides a thin, lubricious filter cake

Advantages

- Meets environmental regulations for North Sea applications
- Provides secondary filtration control properties
- Stable to temperatures up to 280ºF (138ºC), and can be extended with oxygen scavenger products

Typical Properties

Appearance:	White to off-white powder
Specific Gravity:	1.5

Recommended Treatment

Add 5.3-10.5 lb/bbl (15-30 kg/m^3) of BaraCap-1036 to maintain inhibition of hydratable clays in the wellbore. Combine BaraCap-1036 with BaraSure™ W-546 shale stabilizer and GEM™ GP glycol to supplement clay stabilization and enhance drilling performance.

Packaging

BaraCap-1036 encapsulator is available in 55.1-lb (25-kg) bags.

BaraCap™-1037

ENCAPSULATOR

Product Description

BaraCap™-1037 encapsulator is a solid high molecular weight synthetic polymer designed to coat and stabilize reactive clays and shale formations in water-based drilling fluids. After hydration, the polymer seeks out charged clay surfaces in the wellbore. BaraCap-1037 also prevents cuttings erosion and provides a coating on formations and the drilling assembly to minimize hydration and washout.

Applications/Functions

- Freshwater, seawater and monovalent brine-based drilling fluids
- Stabilizes cuttings and reduces hydration of water-sensitive shales
- Provides a polymer coating on the filter cake

Advantages

- Highly effective at low concentration levels
- Minimizes cuttings dispersion and associated drill solids increase
- Provides secondary rheological properties and improved lubricity
- Stable to temperatures up to 300ºF (149ºC)

Typical Properties

Appearance:	White powder
Specific Gravity:	1.00-1.05

Recommended Treatment

Add 0.5-1.5 lb/bbl (1.4-4.3 kg/m^3) of BaraCap-1037 slowly to maintain encapsulation of cuttings and hydratable clays in the wellbore. Avoid high pH greater than 10.3 and pre-treat the fluid system with buffers before contacting cement.

Combine BaraCap-1037 with BaraSure™ shale stabilizers to build customized BaraHib™ high-performance fluid systems with extended run life and enhanced drilling performance.

Packaging

BaraCap-1037 encapsulator is available in 55.1-lb (25-kg) bags.

BaraCarb® 2

BRIDGING AGENT

Product Description

BaraCarb® 2 specially sized, metamorphic ground marble is an acid soluble engineered product for use as a bridging agent in fluid loss applications and also as a rheology modifier. Applied correctly, it can improve the stability of non-aqueous drilling fluids. It has a median particle size (d50) of 2 microns. The ground marble resists size reduction through attrition while drilling, compared to ground sedimentary limestone.

Applications/Functions

- Bridging agent in reservoir drilling fluids for fluid loss control.
- Increases density of aqueous and non-aqueous fluid systems.
- Improves suspension properties / emulsion stability in non-aqueous drilling fluids.

Advantages

- Resists attrition
- Acid soluble
- Non-damaging bridging agent

Typical Properties

Appearance	White powder
Specific gravity, approximate	2.7

Recommended Treatment

Use engineered amount to achieve target d50 as part of a bridging package in reservoir drilling fluids.

Use 5 – 15 lb/bbl (14.3 - 42.8 kg/m3) for suspension / emulsion stability enhancement in non-aqueous fluids.

Packaging

BaraCarb 2 bridging agent is available in 55.1 lb (25 kg) and 50 lb (22.7 kg) sacks.

BaraCarb Agent Particle Size Range

BaraCide™ W-960

BIOCIDE

Product Description

BaraCide™ W-960 biocide is a potent disinfectant and powerful preservative. BaraCide W-960 will maintain the condition of water-based drilling fluids and prevent the growth of biofilms in packer fluids. BaraCide W-960 has an excellent compatibility profile with brines and additives and is effective in the control of bacteria, fungi, and yeasts. BaraCide W-960 has a rapid biocidal action which is maintained with its persistence in solution.

Applications/Functions

- Drilling fluids
- Packer fluids
- Wastewater

Advantages

- Brine and additive compatibility
- Effective at very low loading concentrations
- Widely accepted environmental profile

Typical Properties

Appearance:	Clear yellow liquid
Flash point:	>100°C (>212°F)
Specific gravity:	0.94

Recommended Treatment

Drilling fluids, completion fluids and packer fluids can be preserved with the addition of 0.06 lb/bbl (0.17 kg/m^3). The condition of circulating fluids can be maintained with regular small additions of BaraCide W-960.
Foaming can be observed with BaraCide W-960. Pre-treatment with an anti-foaming product such as NF-6 at 0.07 – 0.15 lb/bbl (0.2 – 0.4 kg/m^3) is recommended as a mitigation.

Packaging

BaraCide W-960 biocide is available in 23 kg (50.6 lb) pails and 1,000 litre (940 kg, 2,070 lb) IBCs.

BaraCor® 450

CORROSION INHIBITOR

Product Description

BaraCor® 450 corrosion inhibitor is a high temperature corrosion inhibitor used in solids-free brine packer fluids. BaraCor 450 corrosion inhibitor forms a protective coating on metal surfaces to help reduce corrosion rates in heavy brines. BaraCor 450 corrosion inhibitor is thiocyanate based and suitable for use in calcium bromide / zinc bromide blends and is stable up to 450°F (232°C).

Applications/Functions

- BaraCor 450 corrosion inhibitor provides corrosion protection in solids-free zinc bromide packer fluids.

Advantages

- Completely soluble in brines such as calcium bromide (CaBr2) / zinc bromide (ZnBr2) brine blends
- Stable at temperatures up to 450°F (232°C)
- BaraCor 450 corrosion inhibitor is ideal for use in solids-free packer fluids used in deep, hot wells. See corrosion data on next page.

Typical Properties

Appearance	Clear Liquid
Flash point, TCC	257°F
Flash point, TCC	125°C
pH	6 to 8
Crystallization point	41 to 59°F
Crystallization point	5 to 15°C
Specific gravity, @ 68°F (20°C)	1.31

Recommended Treatment

The normal concentration of BaraCor 450 corrosion inhibitor is 0.2 to 0.4% by weight of brine.

Example: In 600 barrels of 18 lb/gal CaBr2/ZnBr2 brine packer fluid, use 1.5 -3.0 (55-gallon) drums of BaraCor 450 corrosion inhibitor.

Packaging

BaraCor 450 corrosion inhibitor is packaged in 55-gal (208-l) drums containing 600-lb (273-kg) net weight.

BaraCor® 450 Inhibitor: Corrosion Data

Brine Density lb/gal (Kg/m³)	Temperature °F (°C)	Corrosion Rate, mpy			
		Seven Days Blank	Seven Days BaraCore 450	Thirty Days Blank	Thirty Days BaraCor 450
16.0 (1917)	250 (121)	6.3	1.3	3.8	0.5
16.0 (1917)	300 (149)	8.0	2.9	4.1	0.9
16.0 (1917)	350 (177)	17.2	5.1	10.4	4.6
16.0 (1917)	400 (205)	35.6	10.4	16.6	6.7
18.0 (2175)	250 (121)	11.9	1.8	8.9	1.0
18.0 (2175)	300 (149)	26.0	3.5	9.0	2.4
18.0 (2175)	350 (177)	38.7	6.8	4.9	2.7
18.0 (2175)	400 (205)	44.0	9.5	22.9	3.0
19.2 (2301)	250 (121)	4.9	4.3	7.2	3.5
19.2 (2301)	300 (149)	25.7	7.8	23.3	4.4
19.2 (2301)	350 (177)	89.6	7.7	28.8	2.0
19.2 (2301)	400 (205)	90.2	11.6	34.5	3.0

Notes:
- Brine: $CaBr_2/ZnBr_2$: 20 cc brine/in² coupon
- BaraCor 450: 0.2 % by weight (except 19.2 lb/gal @ 400°F (205°C) – 0.4 % by weight)
- Coupon: Carbon Steel 1010

BaraCor® W-991

CORROSION INHIBITOR

Product Description

BaraCor® W-991 corrosion inhibitor is designed specifically to prevent oxygen corrosion in monovalent brines and drilling fluids. BaraCor W-991 helps to prevent oxygen pitting and will protect drillpipe, casing and other downhole tubulars.

Applications/Functions

- Helps provide corrosion protection for air, foam or mist drilling
- Helps protect drillpipe, casing and tubing
- Helps prevent oxygen pitting

Advantages

- Compatible with fresh water and monovalent brines
- Reduces corrosion rates in the presence of oxygen
- Higher flash point than alternative oxygen corrosion inhibitors

Typical Properties

Appearance	Red brown liquid
Flash point	>121°C
pH (1% solution)	7 - 9

Recommended Treatment

Add 1.0 – 2.0 lb/bbl (2.9 – 5.7 kg/m3) of BaraCor W-991 corrosion inhibitor directly to the system.

Packaging

BaraCor W-991 corrosion inhibitor is packaged in 200 liter drums and 1,000 liter IBCs.

BaraCor® W-476

CORROSION INHIBITOR

Product Description

BaraCor® W-476 corrosion inhibitor is a film forming amine that is water soluble and effective for use in solids-free brines and packer fluids. It can be used in a wide variety of monovalent and divalent brines. BaraCor W-476 corrosion inhibitor is ideally suited for use in the North Sea because of its Yellow environmental rating.

Applications/Functions

- Effective corrosion inhibitor in solids-free packer fluids and other oil and gas industry applications
- Effective at temperatures up to 194°F (90°C) in monovalent (sodium and potassium) brines and up to 338°F (170°C) in divalent brines
- Typical results show over ninety percent corrosion inhibition

Advantages

- Yellow classification in Norway and North Sea applications
- Effective in small concentrations
- Easily dispersed in water

Typical Properties

Form:	Clear liquid
Specific gravity:	1.1
Flash point:	>250°F (121°C)
pH, (1% aqueous):	11 to 12
Solubility:	Water soluble

Recommended Treatment

The normal concentration of BaraCor W-476 corrosion inhibitor is 0.5%-1% by volume.

Packaging

BaraCor W-476 corrosion inhibitor is packaged in 264-gal (1000-L) IBC's and 55-gal (208-L) drums.

BaraDefoam™ 1

DEFOAMER

Product Description

BaraDefoam™ 1 defoamer can be used to reduce or remove surface foam in fresh water and sea water drilling fluids and in viscosified brines. BaraDefoam™ 1 defoamer is effective in low concentrations over a pH range from 2.0 - 12.5.

Applications/Functions

- BaraDefoam™ 1 defoamer can be used to eliminate foam from water-based drilling fluids.

Advantages

- Effective in a pH range of 2.0 – 12.5
- Miscible in water
- Effective in small concentrations

Typical Properties

- Appearance: Clear liquid
- Specific gravity: 0.98

Recommended Treatment

Add 0.05 – 0.2 lb/bbl (0.14 – 0.57 kg/m^3) of BaraDefoam™ 1 defoamer directly to the system.

Packaging

BaraDefoam™ 1 defoamer is packaged in 5-gal (18.9-l) plastic pails and in 55-gal (208-l) drums.

BaraDefoam™ W-300

DEFOAMER

Product Description

BaraDefoam™ W-300 defoamer is used to prevent or reduce foaming in water- and oil-based fluids. BaraDefoam™ W-300 is soluble in oil and dispersible in most brines.

Applications/Functions

- Drilling fluids
- Completion fluids

Advantages

- Effective at small concentrations
- Dispersible in brine
- Compatible with most water-based fluids, including zinc brines
- Can be added directly to the circulating system

Typical Properties

Appearance:	Yellow liquid
Flash point:	134°F (57°C)
pH, (1% aqueous solution):	8
Specific gravity:	0.91

Recommended Treatment

Additions up to 0.75 lb/bbl (2.14 kg/m³) may be required in order to reduce foaming. Any additions of defoamer should be pilot tested in order to avoid over-treating. BaraDefoam™ W-300 can be added before lubricants which may have a foaming tendency.

Caution: BaraDefoam™ W-300 contains petroleum distillate and may create oil sheen.

Packaging

BaraDefoam™ W-300 defoamer is packaged in 5-gal (18.9-l) cans and 55-gal (208-l) drums.

BaraDefoam™ W-1027

DEFOAMER

Product Description

BaraDefoam W-1027 is a highly effective silicone-based defoamer suitable for use in all completion brines and water-based drilling fluids. It is used to either prevent or reduce foaming tendencies since it exhibits both defoaming and antifoaming properties. This product is for Western Hemisphere use only.

Applications/Functions

- Drilling fluids
- Completion fluids

Advantages

- Effective in small concentrations
- Reduces or eliminates foaming across a diverse range of fluid types

Typical Properties

- Appearance: White liquid
- Specific gravity: 0.98
- Flash point: >201°F (94°C)
- Freezing point: ≤32°F (0°C)
- Solubility: Water dispersible; soluble in organic solvents

Recommended Treatment

Add 0.1 – 0.25% v/v to control or prevent foaming occurring. Any addition of the product must be pilot tested in order to avoid over-treating.

Packaging

BaraDefoam W-1027 defoamer is packaged in 200-kg drums.

BaraDefoam™ W-1028

DEFOAMER

Product Description

BaraDefoam W-1028 is a highly effective silicone-based defoamer suitable for use in all completion brines and water-based drilling fluids. It is used to either prevent or reduce foaming tendencies since it exhibits both defoaming and antifoaming properties. This product is for Eastern Hemisphere use only.

Applications/Functions

- Drilling fluids
- Completion fluids

Advantages

- Effective in small concentrations
- Reduces or eliminates foaming across a diverse range of fluid types

Typical Properties

- Appearance: White or yellowish liquid
- Specific gravity: 0.9 – 1.0
- Flash point: >212°F (100°C)
- Freezing point: ≤32°F (0°C)
- Solubility: Water dispersible; soluble in organic solvents

Recommended Treatment

Add 0.1 – 0.25% v/v to control or prevent foaming occurring. Any addition of the product must be pilot tested in order to avoid over-treating.

Packaging

BaraDefoam W-1028 defoamer is packaged in 200-kg drums.

BaraDefoam™ W-611

DEFOAMER

Product Description

BaraDefoam™ W-611 defoamer is a blend of non-ionic surfactants and silicone polymer. BaraDefoam W-611 is used to prevent or reduce foaming tendencies in water-based fluids.

Applications/Functions

- Drilling fluids
- Completion fluids

Advantages

- Reduction or elimination of foaming
- Effective at low concentrations
- Compatible with a range of water-based fluids and brines

Typical Properties

Appearance:	Yellow liquid
Specific gravity:	1.1

Recommended Treatment

Additions of up to 0.25%v/v may be required In order to control foaming. Any addition of defoamer should be pilot tested in order to avoid over-treating. After addition some separation of the components may be observed.

Packaging

BaraDefoam W-611 defoamer is packaged in 20-kg pails and 210-kg drums.

BaraDeMul® W-684

ANTI-EMULSIFIER

Product Description

BaraDeMul W-684 anti-emulsifier is a blend of surface-active agents which prevent the creation of damaging emulsions which can form when native hydrocarbons mix with completion fluids. BaraDeMul W-684 has been designed for use in all completion fluids, including high density calcium and zinc-based brines. BaraDeMul W-684 can enhance the recovery of completion fluids from invaded formations by preventing emulsions.

Applications/Functions

- Dispersible in all mono- and divalent brines
- Compatible and effective in zinc brine systems
- Reduces surface tension in brine mixtures

Advantages

- Prevents emulsion block formation damage
- Effective at very low concentrations
- Helps maximize completion fluid recovery
- Faster, cleaner fluid recovery

Typical Properties

Appearance:	Clear colorless liquid
Specific gravity:	0.93
Flash point:	> 142°F (> 61°C)
Solubility:	Dispersible in water and brine

Recommended Treatment

The addition of BaraDeMul W-684 at a concentration between 0.2 and 0.5% v/v can prevent damaging emulsions. The optimum concentration for an application should be determined from the results of laboratory testing.

Packaging

BaraDeMul W-684 anti-emulsifier is available in bulk quantities.

BaraDeMul® W-1064

ANTI-EMULSIFIER

Product Description

BaraDeMul W-1064 anti-emulsifier is a blend of surface-active agents which prevent the creation of damaging emulsions which can form when native hydrocarbons mix with completion fluids. BaraDeMul W-1064 has been designed for use in all monovalent and calcium-based completion fluids. BaraDeMul W-1064 can enhance the recovery of completion fluids from invaded formations by preventing emulsions.

Applications/Functions

- Dispersible in all monovalent and calcium-containing brines
- Reduces surface tension in brine mixtures
- Helps maximize completion fluid recovery

Advantages

- Prevents emulsion block formation damage
- Effective at very low concentrations
- Faster, cleaner fluid recovery

Typical Properties

Appearance:	Amber liquid
Specific gravity:	0.90
Flash point:	62°F (16°C)
Solubility:	Dispersible in water and brine

Recommended Treatment

The addition of BaraDeMul W-1064 at a concentration between 0.1 and 1.0% v/v can prevent damaging emulsions. The treated brine may also contain a co-solvent or mutual solvent to maximize penetration of surfactant. The optimum concentration for an application should be determined from the results of laboratory testing with produced crude.

Packaging

BaraDeMul W-1064 anti-emulsifier is available in bulk quantities.

BaraDense™ 1033

WEIGHTING MATERIAL

Product Description

BaraDense™ 1033 weighting material is made from micronized manganese tetraoxide particles and is used to increase the density of drilling fluids to control formation pressures. BaraDense 1033 weighting material has a specific gravity of 4.7 or higher and can be used to increase the density of non-aqueous and water-based drilling fluids up to values as high as 22 lb/gal (2.64 sg). BaraDense 1033 weighting material may be easier to suspend than other high density materials due to its very small particle size.

Applications/Functions

- Increases drilling fluid density
- Used to build reservoir drilling fluids with enhanced cleanup from acid solubility
- Helps prepare solids-laden plugs for well control applications

Advantages

- High density reduces material requirements for weighting fluid systems
- Low sag potential compared to larger particle size weighting agents; allows for stable low-viscosity fluids
- Non-abrasive spherical particles retain their shape and size

Typical Properties

Appearance:	Reddish Brown Powder
Specific Gravity:	4.7-4.8
Mean particle size (d50):	2-3 microns

Recommended Treatment

Use DFG™ software to determine the needed quantity of BaraDense 1033 to increase density or formulate weighted fluids. Blends of BaraDense 1033 with barite may be used to reduce costs and provide a broader particle size distribution.

Packaging

BaraDense 1033 weighting material is packaged in 1000-kg (2205-lb) big bags.

BaraFilm®

CORROSION INHIBITOR

Product Description

BaraFilm® corrosion inhibitor is a filming amine corrosion inhibitor that physically and chemically absorbs on metal to help protect it from hydrogen sulfide, carbon dioxide, and oxygen corrosion. BaraFilm corrosion inhibitor can be used in two ways. First, it can be sprayed on dry drill pipe and other tubulars to protect from atmospheric corrosion or in preparation for use down hole. Second, it can be used in a fluid system. It is suitable for use in all brines and water-based drilling fluid systems. When used in a fluid system, BaraFilm corrosion inhibitor is most effective as a slug treatment.

Applications/Functions

- Inhibits hydrogen sulfide, carbon dioxide, or oxygen corrosion attack of metal surfaces
- Protects drillpipe in the hole when used as a slug treatment
- Inhibits formation of corrosion cells in air, foam or mist drilling, low-solids and weighted drilling fluids

Advantages

- Helps provide effective corrosion inhibitor for all water-based drilling fluids
- Effective in small concentrations
- Solubilizes in oil allowing for efficient and even application of inhibitor
- Helps maintain stability at temperatures above 300°F (149°C)

Typical Properties

Appearance	Brown or black liquid
Flash point, PMCC	140°F (60°C)
Specific gravity	0.92
Solubility	Oil soluble

Recommended Treatment

1. Blend BaraFilm corrosion inhibitor in a hydrocarbon carrier between the following treatment ratios:
   - Maximum treatment - 1:6 14 gal BaraFilm corrosion inhibitor/86 gal oil
   - Minimum treatment - 1:13 7 gal BaraFilm corrosion inhibitor/93 gal oil
2. Apply the resultant mixture directly onto metal surfaces, coating all exposed surfaces inside and outside the pipe
3. Mix slug treatment of drillpipe in the hole
   - Initial treatment: Add 1-2 bbl (0.16- 0.32 m^3) directly
   - Continuous treatment: Add 3-5 gal (11-19 l) every 24 hours

   Note: The inhibitor should be applied to the drillpipe rather than mixed into the drilling system. This can help permit better control of drilling fluid properties and can help avoid excessive corrosion inhibitor costs.

Packaging

BaraFilm corrosion inhibitor is packaged in 55-gal (208-l) drums

BARAFLAKE®

LOST CIRCULATION MATERIAL

Product Description

BARAFLAKE® sized calcium carbonate chips are an acid soluble engineered product that can be used alone for lost circulation applications, or preferably as a supplement to other lost circulation treatments such as BaraBlend®-657 lost circulation material (LCM). BARAFLAKE sized calcium carbonate is available in both medium and coarse particle sizes. The sized calcium carbonate chips have a specific gravity of 2.7 with a tougher integrity that resists particle size reduction through attrition while drilling when compared to flake-like calcium carbonate.

Applications/Functions

- BARAFLAKE Coarse and Medium LCM works effectively for:
  - Severe lost circulation problems
  - Remedial pill combinations
- BARAFLAKE C is recommended for use as a supplement with BaraBlend-657 LCM for total loss scenarios.

Advantages

- Fully soluble in 15% HCl
- Helps provide effective plugging

Typical Properties

Appearance:	Tan grey chips
Specific gravity, approximate:	2.7 - 2.78
Typical D50/D90 value:	1490/2071 microns

Recommended Treatment

- As a supplemental material used with BaraBlend-657 LCM, add 10 - 40 lb/bbl. (28.5 - 11.4 kg / m^3) of BARAFLAKE C.
- As a supplemental material used with other combination of LCM, add 10 - 40 lb/bbl total of BARAFLAKE M and/or C.

Packaging

BARAFLAKE LCM is packaged in 50-lb (22.7 kg) sacks.

BaraFLC™ IE-454

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC™ IE-454 filtration control addtive (formerly BDF-454) is a cross-linked polymer that can provide filtration control in oil-based and synthetic-based fluid systems at temperatures up to approximately 500°F (260°C). This product is similar to ADAPTA® filtration control additive, but typically provides lower filtrate and fluid rheology. BaraFLC IE-454 filtration control additive can be used as the primary filtration control additive for high-performance organoclay-free invert emulsion fluids.

Applications/Functions

- Helps provide fluid loss control for invert emulsion fluid systems in temperature ranges up to 500°F
- Lower rheology contribution than ADAPTA filtration control additive

Advantages

- Reduced material requirements compared to some mined filtration control products
- Can be used with other filtration control products
- Easily mixed in dry form through the hopper
- Allows the formulation of invert emulsion fluids with extreme temperature tolerance

Typical Properties

Appearance	White powder
Specific Gravity	1.03
Solubility	Oil swellable / dispersible

Recommended Treatment

Add 1.0 to 8.0 lb/bbl (2.9-22.8 kg/m³) depending on the temperature profile and required level of HTHP filtrate performance.

Packaging

BaraFLC IE-454 filtration control additive is available in 50-lb (22.7-kg) bags.

BaraFLC™ Nano-1

NANOCOMPOSITE WELLBORE SEALANT

Product Description

BaraFLC™ Nano-1 wellbore sealant is a proprietary nanocomposite suspension that provides enhanced sealing capacity to water-based drilling fluids. The individual polymer-coated nanoparticles have an average size of about 100 nanometers which allows them to fill voids in formations and filter cakes built with standard filtration control polymers, solids and particulate materials.

Applications/Functions

- Helps seal a wide range of openings; from microfractures to moderately permeable zones
- Contributes to very low spurt loss when maintained at sufficient concentrations
- Stabilizes shale formations by reducing pore pressure transmission

Advantages

- Highly effective at low concentration levels
- Liquid emulsion product eliminates dust and bag waste
- Minimal effects on rheological properties compared to other polymers
- Stable to temperatures over 350ºF (177ºC)

Typical Properties

Appearance:	Opaque liquid suspension
Specific Gravity:	1.00-1.05

Recommended Treatment

Add 3-15 lb/bbl (8.6-42.8 kg/m^3) of BaraFLC Nano-1 sealant as needed to maintain low to zero spurt loss in the fluid system. The optimum concentration is dependent upon the formation, drilling and dilution rates and the makeup of the fluid.

Packaging

BaraFLC Nano-1 sealant is available in 275-gal (1040-L) totes.

BaraFLC® W-950

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC® W-950 (formerly BDF™-950) high-temperature filtration control additive provides reduced HTHP filtrate values in monovalent brine-based fluid systems. It also functions as a secondary viscosifier, either alone or in combination with pre-hydrated bentonite and other polymers. This proprietary copolymer can be used in place of THERMA-CHEK® and other products.

Applications/Functions

- Provides control of the HTHP filtration at 350ºF and higher temperatures
- Contributes to stable rheological properties

Advantages

- Does not contribute to high plastic viscosity values within normal treatment ranges
- Effective in smaller concentrations than some other high-temperature filtration control additives
- Compatible with all monovalent brines, including saturated sodium chloride
- Calcium tolerant

Typical Properties

Appearance:	White beads
Solubility:	Soluble in water
Specific Gravity:	0.6-0.9

Recommended Treatment

Add 2-6 lb/bbl (5.7-17.1 kg/m^3) of BaraFLC W-950 high-temperature filtration control additive as needed to maintain the fluid system. Use in freshwater or seawater may result in high viscosity, so consider addition of at least 3% weight KCl and/or treatment with THERMA-THIN® to better manage the rheological properties.

Packaging

BaraFLC W-950 high-temperature filtration control additive is available in 50-lb (22.7-kg) bags.

BaraFLC® W-959

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC® W-959 filtration control additive is a liquid polymer solution designed to provide low fluid loss in drilling and workover fluids based on seawater and brines. It exhibits high temperature stability and does not impact cement compatibility like some other filtration control additives. These attributes make BaraFLC W-959 filtration control additive ideal for workover and abandonment operations.

Applications/Functions

- Viscosify brine-based drilling fluids
- Reduce filtration into permeable formations
- Promote hole stability in poorly consolidated formations

Advantages

- Easily mixed with minimal shear required for activation
- Environmentally responsible, with accepted ratings in Norway
- Does not contribute high levels of viscosity when used at recommended dosages

Typical Properties

Appearance:	Dark amber to brown liquid
Specific gravity:	1.1-1.2
Flash point (PMCC):	> 200°F (93°C)

Recommended Treatment

- Use 1-5 lb/bbl (2.9-14.3 kg/m^3) BaraFLC W-959 to control filtrate.

Packaging

BaraFLC W-959 is available in IBCs containing 1140 kg net weight.

BaraFLC® W-971

FILTRATION CONTROL AGENT

Product Description

BaraFLC® W-971 filtration control agent is a non-ionic starch derivative designed to reduce API and HTHP filtrate rates in water-based fluid, specifically reservoir drilling fluids. BaraFLC W-971 is suitable for all water-based fluid designs and effective in both monovalent and divalent brines. It has been designed to lower filtrate with minimal damage to the reservoir, and to allow for removal with acid or N-FLOW™ delayed acid generating breaker systems. With the use of oxygen scavenger / extender additives, BaraFLC W-971 is effective at temperatures reaching 250°F (121°C). For higher temperature reservoir applications N-DRIL HT PLUS should be utilized.

Applications/Functions

- Provides low filtration rates and minimal spurt loss when used with properly sized bridging particles
- Minimizes damage to reservoir

Advantages

- Suitable in fluids formulated with sea water, potassium chloride, sodium chloride, sodium bromide, calcium bromide, and calcium chloride.
- Can be added directly to the system
- Cleans up readily with proper stimulation at low pH

Typical Properties

Appearance	White to off-white powder
Specific gravity	1.5

Recommended Treatment

Mix BaraFLC W-971 through conventional mixing equipment. Typical treatment ranges from 7 - 10 lb/bbl (20 - 28.5 kg/m^3).

Packaging

BaraFLC W-971 is packaged in 50 lb (22.7 kg) bags.

BaraFLC® IE-514

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC® IE-514 (formerly BDF™-514) filtration control additive is a modified lignitic material that provides filtration control in non-aqueous systems. It also helps stabilize invert emulsion drilling fluids in moderate to high temperature working conditions.

Applications/Functions

- Provides fluid loss control for invert emulsion and all-oil fluid systems
- Helps improve emulsion stability

Advantages

Easily mixed in dry form through the hopper with rapid results

Typical Properties

Appearance:	Gray to black powder
Specific Gravity:	1.5 – 1.6
Solubility:	Oil Dispersible

Recommended Treatment

Add 2-20 lb/bbl (5.7-57.1 kg/m³) of BaraFLC IE-514 filtration control additive. Concentration will depend on the degree of filtration control desired.

Packaging

BaraFLC IE-514 filtration control additive is available in 50-lb (23-kg) bags.

BaraFLC® W-437

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC® W-437 (formerly BDF™-437) filtration control additiveis a modified cellulose powder that can be used for in freshwater, seawater and monovalent brine-based drilling fluids up to 300°F (149°C). BaraFLC W-437 filtration control additive also provides secondary shale stability in most applications reducing cuttings and shale erosion and improving bore-hole stability. BaraFLC W-437 filtration control additive typically shows slightly reduced viscosity and fluid loss control but otherwise compares well to PAC-L™ and can be a cost effective alternative in non-critical applications..

Applications/Functions

- Decreases filtration rate and filter cake thickness in fresh or brackish water-based drilling fluids
- Promotes hole stability in water-sensitive formation

Advantages

- Effective in small concentrations
- Effective in salt water
- Is environmentally responsible and does not ferment
- Readily disperses when mixed through a hopper

Typical Properties

Appearance:	White to off-white solid
pH, (1% solution):	6.5 to 9
Specific gravity:	1.6
Solubility:	Water dispersible

Recommended Treatment

1. Add 0.3-1.5 lb/bbl l (0.87-4.3 kg/m^3) to fresh or brackish water-based fluids.
2. Sift slowly into a jet mixer or into the vortex of a high-speed stirrer

Packaging

BaraFLC W-437 filtration control additive is available in 50-lb (22.7-kg) sacks

BaraFLC® W-445

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC® W-445 (formerly BDF™-445) filtration control additive is a specialty starch that is designed to be more easily removed from the wellbore than other starch based fluid loss agents. BaraFLC W-445 filtration control additive is suited for applications up to 200°F (93°C) and can be used in water-based drilling, workover and completion fluids as well as pre- and post-gravel pack fluids and within lost circulation pills. BaraFLC W-445 filtration control additivet is easily degraded by live acid and N-FLOW™ delayed acid generators.

Applications/Functions

BaraFLC W-445 filtration control additive, when used with properly sized bridging/weighting particles, can provide filtration control and minimize damage to the productive formation.

Advantages

- Suitable for all water-based drilling fluids, workover and completions fluids including: sea water, potassium chloride, magnesium chloride, sodium chloride, sodium bromide, potassium formate, calcium bromide, zinc bromide and cesium formate
- Soluble in acids and oxidizers – cleans up readily following drilling, workover or completion operations
- Environmentally responsible, presenting no toxicity or ecological problems

Typical Properties

Appearance:	White, free flowing powder
Bulk Density:	30 to 44 lb/ft^3

Recommended Treatment

Disperse BaraFLC W-445 filtration control additive through conventional mud mixing equipment. Concentrations range from 3-9 lb/bbl (8-26 kg/m^3).

Packaging

BaraFLC W-445 filtration control additive is packaged in 50-lb (22.7-kg) sacks

BaraFLC® W-490

SHALE STABILIZER / FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC® W-490 (formerly BDF™-490) shale stabilizer / filtration control additive is a sulfonated asphalt, partially soluble in water and oil, and can be used in water and oil-based fluids where it functions as a shale stabilizer, cuttings dispersion inhibitor and contributes to high temperature fluid loss control. It is stable to many normal drilling fluid contaminants, operates at a broad pH range and is suitable for use up to 340°F (170°C). BaraFLC W-490 shale stabilizer / filtration control additive helps to form a thin yet tough wall cake and the small particles can effectively plug micro-fractures.

Applications/Functions

- Stabilize shale
- Reduce high temperature fluid loss

Advantages

- Helps inhibit cuttings dispersion
- Exhibits temperature stability up to 340°F (170°C)
- Helps form a thin, tough wall cake
- Significantly increases lubricity
- Can be used in most mud formulations
- Readily disperses in water and oil fluids

Typical Properties

Appearance:	Black powder
Specific gravity:	0.98

Recommended Treatment

Add 2-6 lb/bbl (5.7-17 kg/m³) of BaraFLC W-490 shale stabilizer / filtration control additive to the active fluid system

Packaging

BaraFLC W-490 shale stabilizer / filtration control additive is available in 50-lb (22.7-kg) sacks

BaraFLC® W-616

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC® W-616 (formerly CFS™-616) filtration control additive is a liquid based modified bio-polymer that is used to reduce filtration losses of drilling and completion fluids. BaraFLC W-616 filtration control additive can be used in freshwater, seawater, monovalent, and divalent brines. As a liquid dispersion, BaraFLC W-616 filtration control additive allows for rapid mixing into brine based fluids. BaraFLC W-616 filtration control additive is non-damaging and can be used at temperatures up to 250°F+ (121°C+). BaraFLC W-616 filtration control additive is designed to be used in conjunction with BaraVis® W-617 viscosifier.

Applications/Functions

- Provides improved fluid loss control for fresh water and brine-based fluids used in drilling, completing, and gravel packing operations
- Provides secondary viscosity
- Used in conjunction with BaraVis W-617 viscosifier for high density brine applications

Advantages

- Helps reduce fluid losses in a wide variety of aqueous fluid systems
- Suitable for use in high density calcium and bromide based brines
- Stable up to 250°F+ (121°C+)

Typical Properties

Appearance:	Clear tan liquid
Specific Gravity:	1.05
Solubility:	Water Soluble

Recommended Treatment

Add 1.0-4.0 gal/bbl of BaraFLC W-616 filtration control additive.

Higher temperatures will generally require higher concentrations of BaraFLC W-616 filtration control additive.

Packaging

BaraFLC W-616 filtration control additive is packaged in 5-gal cans and 55-gal drums.

BARAFOS®

THINNER

Product Description

BARAFOS® thinner is a phosphate based product that acts as a thinner and dispersant in freshwater drilling fluids. It is environmentally responsible and contains no heavy metals. BARAFOS thinner is best suited for low temperature, simple gel based systems. BARAFOS thinner does not tolerate saline conditions.

Applications/Functions

- Thin the mud and allow sand and cuttings to settle out
- Minimize thickening due to anhydrite, gypsum, or cement contamination
- Disperse sticky clays which cause problems such as mud rings and bit balling

Advantages

- Helps thin clay or bentonite slurries quickly
- Effective in small concentrations
- Dissolves rapidly
- Environmentally responsible

Typical Properties

Appearance:	White powder
pH, (1% aqueous solution):	9.7
Specific Gravity:	44lb/ft³ (705kg/m³)

Recommended Treatment

Add 0.1-0.50 lb/bbl (0.3-1.5 kg/m³) of BARAFOS thinner to fresh water mud slowly at the flow line.

Packaging

BARAFOS thinner is packaged in 50-lb (22.7-kg) sacks.

BaraFresh®-1063

ODOR CONTROL ADDITVE

Product Description

BaraFresh-1063 odor control additive is a liquid chemical treatment for non-aqueous fluids to control the odors associated with such systems. BaraFresh-1063 can be applied to non-aqueous fluids containing a variety of different base oils, including diesel, mineral oil, and synthetic oils. Particularly relevant for operations in sensitive areas which require emissions to be controlled, BaraFresh-1063 can be utilized to help eliminate odor-causing emissions.

Applications/Functions

- Odor control for a range of non-aqueous fluids including INVERMUL diesel-based systems
- No adverse impact on drilling fluid properties

Advantages

- Non-flammable
- No hazardous ingredients
- Low dosage required for maximum odor control

Typical Properties

Appearance:	Clear yellow liquid
Odor:	Slight citrus
Specific gravity:	0.88
Flash point:	239°F (115°C)

Recommended Treatment

BaraFresh-1063 should be added directly to the drilling fluid system at an initial concentration of 0.03% v/v.

A maximum concentration of 0.5% v/v should not be exceeded.

Packaging

BaraFresh-1063 is available in 5-gal (18.9-l) pails.

BaraGel™ W-601

FILTRATION CONTROL AGENT

Product Description

BaraGel™ W-601 cross-linked gel system is used to control fluid losses in open hole sections and completions. It can be used to suspend fluid leak-off to permeable formations/perforations during completion and workover operations. The high viscosity of the gel controls losses without the addition of solids.

Applications/Functions

- Suspend losses during completion and workover operations
- Use in brines up to 12.5 ppg
- Disperse with acid treatment

Advantages

- Premixed cross-linked system
- Prevents fluid invasion induced formation damage
- Maintains performance up to 325°F
- No requirement for dedicated mixing and pumping systems

Typical Properties

Form:	Viscous opaque gel
Specific gravity, at 20°C:	1.25
pH:	8-10
Viscosity:	>10,000 cP

Recommended Treatment

For fluid loss control, add a volume of BaraGel W-601 gel equivalent to 120% of the volume of the loss zone with enough brine to begin pumping and spot in position. Do not mix into a homogenous mixture before pumping. The BaraGel W-601 gel should remain separated from the brine. Treatment with acid will disperse the gel and restore circulation.

Packaging

BaraGel W-601 gel system is available in 5-gal. pails and in bulk quantities.

BaraGel™ W-602

FILTRATION CONTROL AGENT

Product Description

BaraGel™ W-602 cross-linked gel system is used to control fluid losses in open hole sections and completions. It can be used to suspend fluid leak-off to permeable formations/perforations during completion and workover operations. The high viscosity of the gel controls losses without the addition of solids.

Applications/Functions

- Suspend losses during completion and workover operations
- Use in brines up to 17.5 ppg
- Disperse with acid treatment

Advantages

- Premixed cross-linked system
- Prevents fluid invasion induced formation damage
- Maintains performance up to 325°F
- No requirement for dedicated mixing and pumping systems

Typical Properties

Form:	Viscous opaque gel
Specific gravity, at 20°C:	1.62
pH:	8-10
Viscosity:	>10,000 cP

Recommended Treatment

For fluid loss control, add a volume of BaraGel W-602 gel equivalent to 120% of the volume of the loss zone with enough brine to begin pumping and spot in position. Do not mix into a homogenous mixture before pumping. The BaraGel W-602 gel system should remain separated from the brine. Treatment with acid will disperse the gel and restore circulation.

Packaging

BaraGel W-602 gel system is available in 5-gal. pails and in bulk quantities.

BaraG-Force™ C-16 Centrifuge

The robust variable frequency drive (VFD) BaraG-Force™ centrifuges are designed to process high volumes at high G-forces to optimize drilling fluid performance while simplifying installation, operation and maintenance.

Technical Specifications

Bowl			
Material	Duplex 2205	**Sigma MAX**	31,215 ft² (2900 m²)
Diameter	16 in. (406 mm)	**Beach Length**	12.5 in. (318 mm)
Bowl Length	56 in. (1422 mm)	**Beach Angle**	10°
Discharge Ports	(8) Tungsten Carbide	**Effluent Ports**	(4) Eccentric Dams
Wear Plates	Urethane	**Max. Speed**	3,700 rpm
Conveyor			
Type Design	Axial or Radial	**Related Bowl**	Leading
Tiles	50% Tiles, 50% HF	**Feed Zone**	Replaceable
Lead Direction	Left		
Gearbox			
Type	Planetary	**Ratio**	55:1
Position	Inboard	**Max. Output**	5,240 ft-lb (7.1 kNm)
Max. Differential Speed	61 rpm		
Capacities			
Max. Feed	250 gpm (950 lpm)	**Bowl Motor**	75 hp (56 kW)
Max. Acceleration	3,140 G-force	**Conveyor Motor**	25 hp (19 kW)
Control Panels			
Classification	UL Class 1, Div 1	**Types:**	Fully Variable
Power	380/480 VAC, 3-Phase	**Communication:**	Human Machine Interface
Cooling	Patented Heat Sync		
Dimensions			
Centrifuge:	Length: 158 in. (4013 mm)	**Control Panel:**	Length: 73 in. (1854 mm)
	Width: 43 in. (1092 mm)		Width: 39 in. (990 mm)
	Height: 48 in. (1219 mm)		Height: 80 in. (2032 mm)
	Weight: 6,724 lb (3050 kg)		Weight: 1,890 lb (857 kg)

BaraG-Force™ C-20 Centrifuge

The robust variable frequency drive (VFD) BaraG-Force™ centrifuges are designed to process high volumes at high G-forces to optimize drilling fluid performance while simplifying installation, operation and maintenance.

Technical Specifications

Bowl			
Material	Duplex 2205	**Sigma MAX**	78,770 ft² (7318 m²)
Diameter	20 in. (508 mm)	**Beach Length**	19.68 in. (500 mm)
Bowl Length	80 in. (2032 mm)	**Beach Angle**	8°
Discharge Ports	(10) Tungsten Carbide	**Effluent Ports**	(6) Eccentric Dams
Wear Plates	Urethane	**Max. Speed**	3,500 rpm
Conveyor			
Type Design	Axial or Radial	**Related Bowl**	Leading
Tiles	50% Tiles, 50% HF	**Feed Zone**	Replaceable
Lead Direction	Left		
Gearbox			
Type	Planetary	**Ratio**	52:1
Position	Inboard	**Max. Output**	6,640 ft-lb (9.0 kNm)
Max. Differential Speed	61 rpm		
Capacities			
Max. Feed	500 gpm (1893 lpm)	**Bowl Motor**	150 hp (112 kW)
Max. Acceleration	3,578 G-force	**Conveyor Motor**	50 hp (37 kW)
Control Panels			
Classification	UL Class 1, Div 1	**Types:**	Fully Variable
Power	380/480 VAC, 3-Phase	**Communication:**	Human Machine Interface
Cooling	Patented Heat Sync		
Dimensions			
Centrifuge:	Length: 192.4 in. (4888 mm)	**Control Panel:**	Length: 95 in. (2413 mm)
	Width: 47 in. (1194 mm)		Width: 39 in. (990 mm)
	Height: 55.7 in. (1415 mm)		Height: 82 in. (2082 mm)
	Weight: 11,101 lb (5035 kg)		Weight: 2,225 lb (1009 kg)

BaraKlean®-648

CASING CLEANER

Product Description

BaraKlean®-648 casing cleaner is a powerful blend of surfactants and solvents used in fluid displacement and cleanup operations. BaraKlean-648 casing cleaner has strong cleaning and wetting actions to break and disperse mud film and residue. BaraKlean-648 casing cleaner is soluble in all common brines and is very effective in the removal of a range of water, oil and synthetic based fluids.

Applications/Functions

- Displacements and cleanup operations
- Surface cleaning and circulation
- Formulated into wash pills and spacers

Advantages

- Cleaning performance can reduce cleanup times
- Effective in mono- and divalent brines
- Granted the best possible environmental rating

Typical Properties

Appearance:	Clear, yellow liquid
Specific gravity:	0.99
pH:	6-7
Flash point:	>212˚F (>100˚C)

Recommended Treatment

BaraKlean-648 casing cleaner should be used as part of an engineered displacement system. Typically, BaraKlean-648 casing cleaner should be used at concentrations between 8 and 15% to prepare a wash pill. This can be used as part of an optimized displacement train.

Packaging

BaraKlean-648 casing cleaner is packaged in 55 gal (208 liter) drums and 264 gal (1,000 liter) IBCs.

BaraKlean™-926

CASING CLEANER

Product Description

BaraKlean™-926 casing cleaner is a powerful blend of surfactants and solvents used in fluid displacement and wellbore clean-up operations. BaraKlean-926 has a high cleaning capacity and a strong wetting action to break up and disperse mud film and residue. BaraKlean-926 has been developed to remove solids and residue in water-, oil- and synthetic-based fluid systems.

Applications/Functions

- Displacements and cleanup operations
- Surface cleaning and circulation
- Formulated into wash pills and spacers

Advantages

- Rapid cleanup with minimum interface
- Effective in mono- and divalent brines
- Effective on both oil and water-based fluid residue
- Granted the best possible environmental rating

Typical Properties

Appearance:	Pale yellow liquid
Flash point, PMCC:	(180°F) 82°C
Specific gravity:	0.83

Recommended Treatment

BaraKlean-926 should be used as part of an engineered displacement system. BaraKlean-926 should be used at concentrations between 10 and 20% to prepare a wash pill. This should be used as part of an optimized displacement train.

Packaging

BaraKlean-926 casing cleaner is available in 208 liter (55 gal) drums and 1,000 liter (264 gal) IBCs.

BaraKlean®-951

CASING CLEANER

Product Description

BaraKlean®-951 casing cleaner is a solvent-based product used to remove oil-based mud residues during displacements. BaraKlean-951 casing cleaner is highly efficient and can be used in smaller pill sizes than surfactants which helps reduce waste volume. BaraKlean-951 casing cleaner is a natural by-product from plant sources.

Applications/Functions

- Removes oil-wet solids from casing and other metal surfaces
- Used as part of a clean-up train to displace oil-based fluids from a well

Advantages

- Helps decrease clean-up time and waste volume
- Effective in all oil-based fluid types
- Miscible in oil

Typical Properties

- Appearance: Colorless liquid
- Specific gravity: 0.86
- Flash point: 114.8°F (46°C)

Recommended Treatment

BaraKlean-951 casing cleaner is most effective when applied neat as part of an engineered casing cleaner train. It is insoluble in water and cannot be diluted or mixed with completion brine as a spacer.

Packaging

BaraKlean-951 casing cleaner is available in bulk quantities.

BaraKlean®-975

CLEANER

Product Description

BaraKlean®-975 cleaner is a surfactant solution used for open-hole displacements as a gentler alternative to powerful solvent/surfactant blends such as BaraKlean-926 and BaraKlean-648. BaraKlean-975 cleaner will water-wet and disperse mud film and residue. BaraKlean-975 cleaner is soluble in all common brines.

Applications/Functions

- Open-hole displacements and cleanup operations
- Surface cleaning and circulation
- Formulated into push and wash pills

Advantages

- Aids the open-hole displacement of non-aqueous fluids to water-based fluids or brines
- Effective in mono- and divalent brines
- Granted the best possible environmental rating

Typical Properties

Appearance:	Brown liquid
Specific gravity:	1.012
pH:	6 – 9 (1% aqueous solution)
Flash point:	> 394°F (201°C)

Recommended Treatment

Typical pill concentrations of 2.5 – 10% v/v are recommended as part of an engineered displacement system.

Packaging

BaraKlean-975 cleaner is packaged in 1,000-liter (264-gal) IBCs

BaraLock®-666.F

LOST CIRCULATION MATERIAL

Product Description

BaraLock®-666.F premium fine-sized reticulated foam lost circulation material (LCM) is used as a supplement to any LCM pill formulation in any fluid type and any formation, but not intended for reservoir applications. This proprietary, engineered, supplemental solution is designed to help seal fractures up to at least 3,000 microns. BaraLock-666.F LCM is designed to be used in combination with other LCM materials as a remedial treatment for the most challenging lost circulation scenarios – including total losses. Its unique structure helps minimize drilling non-productive time, while being able to be pumped through typical bottom-hole assemblies (BHAs) using a specially designed pump procedure.

Applications/Functions

- Applicable for when drilling into severe to total loss-prone areas in any formation type (permeable or impermeable)

Advantages

- Versatile solution for enhanced fracture plugging; can be added as a supplement to any LCM pill

Typical Properties

- Appearance: Black or grey fine-sized reticulated foam, smaller than 7 mm
- Specific gravity: 1.1 - 1.4

Recommended Treatment

For sealing fractures, fissures and holes up to 3,000 microns, typical concentrations should be around 0.5 lb/bbl. Please consult the Standard Field Application Procedure for BaraShield®-664 LCM for supplemental product additions and pump procedures of BaraLock-666.F LCM.

Packaging

BaraLock-666.F LCM is packaged in 2 lb (0.91 kg) sacks.

BaraLock®-666.M

LOST CIRCULATION MATERIAL

Product Description

BaraLock®-666.M premium medium-sized reticulated foam lost circulation material (LCM) is used as a supplement to any LCM pill formulation in any fluid type and any formation, but not intended for reservoir applications. This proprietary, engineered, supplemental solution is designed to help seal fractures up to at least 10,000 microns. BaraLock-666.M LCM is designed to be used in combination with other LCM materials as a remedial treatment for the most challenging lost circulation scenarios – including total losses. Its unique structure helps minimize drilling non-productive time, while being able to be pumped through drill strings equipped with a bypass tool.

Applications/Functions

- Applicable for when drilling into severe to total loss-prone areas in any formation type (permeable or impermeable)

Advantages

- Versatile solution for enhanced fracture plugging; can be added as a supplement to any LCM pill

Typical Properties

- Appearance: Black or grey medium-sized reticulated foam, smaller than 14 mm
- Specific gravity: 1.1 - 1.4

Recommended Treatment

For sealing fractures, fissures and holes up to 10,000 microns, typical concentrations should be around 0.25 lb/bbl. Please consult the Standard Field Application Procedure for BaraShield®-664 LCM for supplemental product additions and pump procedures of BaraLock-666.M LCM.

Packaging

BaraLock-666.M LCM is packaged in 2 lb (0.91 kg) sacks.

BaraLube® Gold Seal

LUBRICANT

Product Description

BaraLube® Gold Seal lubricant is a blend of surfactants and lubricants specifically formulated to be an effective alternative to oil-based lubricants where environmental constraints preclude the use of hydrocarbon-based additives. This concentrated blend of lubricity additives can provide optimal extreme pressure (metal-to-metal) and borehole (metal-to-formation) lubricity without having a negative affect on the drilling fluid properties. BaraLube Gold Seal lubricant is water soluble, does not form a sheen and is biodegradable. Caution should be observed when using this product in drilling fluids containing high concentrations of divalent cations, e.g. Calcium, and well temperatures of near 300°F (149°C) because soaping out of this product could take place.

Applications/Functions

» BaraLube Gold Seal lubricant can be used to reduce torque and drag and sticking shale problems.

Advantages

» Is completely water soluble
» Does not form a sheen
» Is nonpolluting and biodegradable

Typical Properties

» Appearance	Clear amber liquid
» Flash point	>200°F (93°C)
» Specific gravity	0.94
» Solubility	Water soluble

Recommended Treatment

BaraLube Gold Seal lubricant is a concentrated product; add 2-5% by volume. 2% is recommended for all but the most severe cases.

Note: Heavily weighted drilling fluids may require slightly higher concentrations.

Packaging

BaraLube Gold Seal lubricant is packaged in 1-gal (3.8-l), 5-g (18.9-l), 55-gal (208-l) drums and in bulk.

BaraLube® NS

LUBRICANT

Product Description

BaraLube NS® lubricant is an environmentally acceptable blend of acids, esters and natural oils, which can effectively reduce torque and drag in water-based drilling fluids. It carries environmental ratings of Gold in UK, yellow in Norway and an R in the Netherlands. BaraLube NS lubricant is an effective extreme pressure lubricant by lowering the steel/steel friction coefficient. BaraLube NS lubricant can be added through the hopper or directly to the suction pit if sufficient agitation is available. An injection pump can also be used to inject the product directly into the suction. BaraLube NS lubricant is suitable for applications up to 300°F (149°C).

Applications/Functions

- BaraLube NS lubricant can be used to reduce torque and drag

Advantages

- BaraLube NS filming type extreme pressure lubricant is particularly effective in lowering the steel/steel friction.
- BaraLube NS lubricant is compatible with most emulsion systems and is suitable both in high and low aromatic base fluid environments.
- BaraLube NS lubricant is a liquid and will not screen out of the system. Being a filming type lubricant, product depletion will occur and will be related to the coating of steel in the wellbore and filtercake/cuttings in the open hole.
- Fluid properties are not adversely affected by additions of BaraLube NS lubricant, and fluid loss in emulsion systems treated with BaraLube NS lubricant will generally be lowered.
- BaraLube NS lubricant can be mixed through the hopper or directly to the suction pit if sufficient agitation is available. An injection pump can also be used to inject the product directly into the suction.

Typical Properties

Appearance	Clear amber liquid
Flash point	428°F (220°C)
Specific gravity	0.983

Recommended Treatment

Optimum concentration is 2.5 - 4% v/v

Systems should be treated with minimum 2.5% initially, and the concentrations should be maintained through the interval where torque is expected. A decrease in torque should occur once the system is fully treated, and torque should be less erratic.

A concentrated pill of BaraLube NS lubricant can also be beneficial if elevated torque is experienced during running casing or liner. It is recommended to double the concentration in spots to 5-8% v/v.

Packaging

BaraLube NS lubricant is packaged in 55-gal (208-l) drums containing 386-lb (179-kg) net wt, or in bulk.

BaraLube® W-520

LUBRICANT

Product Description

BaraLube® W-520 lubricant is designed to improve lubricity in brine based completion fluids. It imparts lubricity to most completion fluids at low concentrations and passes Gulf of Mexico oil and grease discharge limitations. BaraLube W-520 lubricant reduces torque, and it is an excellent metal to metal friction reducer which minimizes casing wear. It has been found to reduce metal-to-metal friction by up to 70%. BaraLube W-520 lubricant is suitable for use in monovalent and divalent brines.

Applications/Functions

- Reduces torque by improving the lubricity of most water-based completion fluids
- Reduces metal to metal friction which helps protect casing in deviated holes
- Can be used in fresh water, sea water, monovalent and divalent brines

Advantages

- Passes oil and grease discharge limitations
- Has low toxicity and no sheen from discharges
- Allows greater flexibility in coil tubing and logging operations in completion fluid applications for deviated wells
- Does not soap out when used in calcium chloride brine

Typical Properties

Form:	Clear liquid
Specific gravity:	1.02
Flash point:	>212°F (100°C)
pH:	7 to 9
Solubility:	Water soluble

Recommended Treatment

Add 0.5% to 2% by volume of BaraLube W-520 lubricant directly to the fluid.

Packaging

BaraLube W-520 lubricant is available in 5-gal (19-l) plastic pail and 55-gal (210-l) drums.

BaraLube™ W-612

LUBRICANT

Product Description

BaraLube™ W-612 lubricant is a blend of tall oil derivatives that reduces downhole friction between metal-to-metal and metal-to-formation contacts without having a negative effect on the drilling fluid properties. BaraLube W-612 lubricant is easily dispersible in water. It is effective in fresh water and low salinity drilling fluids. Caution should be observed when using this product in drilling fluids containing high concentrations of monovalent or divalent cations, e.g. sodium or calcium, as soaping out of this product may take place.

Applications/Functions

BaraLube W-612 lubricant can be used to reduce torque and drag and sticking shale problems

Advantages

- Can be rapidly incorporated into the active mud system.
- Immediately minimizes friction on contact.
- Helps prevent excessive wear on casing/collars

Typical Properties

Appearance:	Amber liquid
Specific Gravity:	0.89

Recommended Treatment

For normal treatment, add 1-3% by volume to the system to reduce friction.

To free stuck pipe, add 6-10% by volume in a slug or sweep treatment.

Packaging

BaraLube W-612 lubricant is packaged in 170 kg drums.

BaraLube® W-933

FLUID ADDITIVE

Product Description

BaraLube® W-933 lubricant is an ester-based additive for the reduction of torque and drag in water-based drilling and completion systems. BaraLube W-933 is formulated with surfactants and emulsifiers which enhance the dispersion of the lubricants. BaraLube W-933 can provide lubrication of metal to metal and metal to rock surfaces in high friction environments. BaraLube W-933 will perform in a range of water and monovalent brine base fluids.

Applications/Functions

- Reduces rotational torque and drag
- Reduces metal/metal and metal/rock friction
- Water-based drilling and completion fluids

Advantages

- Effective in monovalent brines
- Highly dispersible
- Maintains lubrication up to 350°F (177°C)

Typical Properties

Appearance	Amber liquid
Flash point, PMCC	>300°F (149°C)
Specific gravity	0.98

Recommended Treatment

Lubrication can be achieved with concentrations of around 3% v/v BaraLube W-933. After initial treatment, periodic applications will maintain the desired concentration and performance.

Packaging

BaraLube W-933 lubricant is available in 55 gallon (208 liter) drums.

BaraLube™ W-935

LUBRICANT

Product Description

BaraLube W-935 lubricant is a polyglycol-based additive for the reduction of torque and drag in water-based drilling and completion fluid systems. BaraLube W-935 can provide lubrication of both metal-to-metal and metal-to-rock surfaces in highly deviated wellbores. BaraLube W-935 will perform in a range of base fluids, including divalent brines. The solubility and compatibility profiles of BaraLube W-935 make it suitable for completion as well as drilling applications.

Applications/Functions

- Reduces rotational torque and drag
- Reduces metal-on-metal and metal-on-rock friction
- Water-based drilling and completion fluids

Advantages

- Effective in mono- and divalent brines
- High solubility
- Forms low turbidity solutions

Typical Properties

Appearance:	Amber liquid
Specific gravity:	1.26
Flash point:	>392°F (200°C)

Recommended Treatment

Lubrication can be achieved with concentrations of around 3% v/v BaraLube W-935. After initial treatment periodic applications will maintain the desired performance.

Packaging

BaraLube W-935 is available in 55-gal (208-l) drums.

BaraLube® W-940

LUBRICANT

Product Description

BaraLube W-940 lubricant is a phosphonate-based additive for the reduction of torque and drag in water-based drilling and completion systems. BaraLube W-940 lubricant can provide lubrication of metal to metal and metal to rock surfaces in highly deviated well plans. BaraLube W-940 lubricant has an excellent compatibility profile, performs in a range of base fluids and resists oil contamination. The solubility of BaraLube W-940 lubricant makes it suitable for completion as well as drilling applications.

Applications/Functions

- Reduces rotational torque and drag
- Reduces metal/metal and metal/rock friction
- Water-based drilling and completion fluids

Advantages

- Effective in fresh water, mono- and divalent brines
- High solubility
- Low foaming tendencies

Typical Properties

Appearance:	Light yellow liquid
Flash point, PMCC:	>100°C (212°F)
Specific gravity:	1.1

Recommended Treatment

Lubrication can be achieved with concentrations of around 2% v/v BaraLube W-940 lubricant. After initial treatment, periodic applications will maintain the desired concentration and performance. This chemical is affected by the presence of active clays so additional product may be required to overcome this and maintain the desired level of torque reduction.

Packaging

BaraLube W-940 lubricant is available in 208 liter (55 gallon) drums and 1,000 liter (264 gallon) IBCs.

BaraLube® W-941

LUBRICANT

Product Description

BaraLube W-941 lubricant is a modified fatty acid additive for the reduction of torque and drag in water-based drilling and completion systems. BaraLube W-941 lubricant can provide lubrication of metal to metal and metal to rock surfaces in highly deviated well plans. BaraLube W-941 lubricant has an excellent compatibility profile, performs in a range of base fluids and resists oil contamination. The solubility of BaraLube W-941 lubricant makes it suitable for completion as well as drilling applications.

Applications/Functions

- Reduces rotational torque and drag
- Reduces metal/metal and metal/rock friction
- Water-based drilling and completion fluids

Advantages

- Effective in fresh water, mono- and divalent brines
- High solubility
- Forms low turbidity solutions

Typical Properties

Appearance:	Clear amber liquid
Flash point, PMCC:	>100°C (212°F)
Specific gravity:	1.1

Recommended Treatment

Lubrication can be achieved with concentrations of around 2% v/v BaraLube W-941 lubricant. After initial treatment, periodic applications will maintain the desired concentration and performance. BaraLube W-941 lubricant may stabilize foaming in some fluids and this tendency should be tested. This behavior can be controlled with anti-foam additives.

Packaging

BaraLube W-941 lubricant is available in 208 liter (55 gallon) drums and 1,000 liter (264 gallon) IBCs.

BaraLube® W-1021

ENCAPSULATED LUBRICANT

Product Description

BaraLube® W-1021 lubricant is comprised of 5 – 10 micro-sized encapsulates that contain customized lubricating oil which is only released upon exposure to friction and shear. BaraLube W-1021 is suitable for use in a range of water- and brine-based fluids, including those containing calcium salts. It is non-hazardous, biodegradable and acid-soluble. BaraLube W-1021 will provide lubricity at temperatures in excess of 300°F (150°C).

Applications/Functions

- Targeted metal-on-metal friction reduction in aqueous environments
- Reduces fluid loss as a secondary function without adversely affecting rheology profile

Advantages

- Reduces friction and torque where it is needed
- Does not react with other fluid additives or cuttings
- Unaffected by frozen storage
- Tolerant to high pH and divalent ion environments

Typical Properties

- Appearance: Tan powder
- Specific gravity: 1.09

Recommended Treatment

Add 12 – 18 lb/bbl (34 – 51 kg/m^3) of BaraLube W-1021 lubricant through premix additions while drilling to ensure complete dispersion. Refer to specific lab and field mixing guidelines for more detailed information.

Packaging

BaraLube W-1021 lubricant is available in 661 lb (300 kg) bags. Bags must be kept completely sealed and do not allow moisture to accumulate on the top.

BaraLube® W-1056

LUBRICANT

Product Description

BaraLube® W-1056 lubricant is a highly effective lubricant for reducing torque and drag in fresh water and brine-based drilling fluid systems. BaraLube W-1056 lubricant has no adverse effect on the drilling fluid properties and is suitable for use in high temperature environments above 400°F (204°C).

Applications/Functions

- Helps reduce torque and drag during drilling
- Helps provide lubricity in water-based drilling fluids

Advantages

- Reduces coefficient of friction in water-based drilling fluids
- Salt tolerant
- Thermally stable > 400°F (204°C)

Typical Properties

Appearance:	Black liquid
Specific gravity:	0.94
pH:	5 - 6

Recommended Treatment

For drilling operations utilize 2 – 4% v/v BaraLube W-1056 lubricant to address torque and drag concerns.

Packaging

BaraLube W-1056 lubricant is packaged in 55-gal (208-l) drums.

BaraLube® W-1058

LUBRICANT

Product Description

BaraLube® W-1058 lubricant can be used to reduce torque and drag in fresh water and brine-based drilling fluid systems. BaraLube W-1058 lubricant has no adverse effect on drilling fluid properties and is compatible in a wide range of fluid types, including calcium brines.

Applications/Functions

- Helps reduce torque and drag during drilling
- Helps provide lubricity in water-based drilling fluids
- Help to reduce cases of differentially stuck pipe when used in conjunction with bridging materials

Advantages

- Reduces coefficient of friction in water-based drilling fluids
- Water soluble

Typical Properties

- Appearance: Yellow liquid
- Specific gravity: 1.22 – 1.24
- Flash point: 320°F (160°C)

Recommended Treatment

For drilling operations utilize 2 – 4% v/v BaraLube W-1058 lubricant to address torque and drag concerns.

Packaging

BaraLube W-1058 lubricant is packaged in 55-gal (208-l) drums.

BaraLube® W-511

LUBRICANT

Product Description

BaraLube W-511 drilling lubricant is a phosphonate-based additive for the reduction of torque and drag in water-based drilling and completion systems. BaraLube W-511 can provide lubrication of metal to metal and metal to rock surfaces in highly deviated well plans. BaraLube W-511 will perform in a range of base fluids, including divalent brines.

. Applications/Functions

- Reduces rotational torque and drag
- Reduces metal/metal and metal/rock friction
- Water-based drilling and completion fluids

Advantages

- Effective in mono- and divalent brines
- Granted the best possible environmental rating

Typical Properties

Form:	Light yellow liquid
Specific gravity:	1.05
Flash point:	>212°F (>100°C)
Pour point:	<41°F (<5°C)
pH:	3-4
Solubility:	Water soluble

Recommended Treatment

Lubrication can be achieved with concentrations of around 2% v/v BaraLube W-511. After initial treatment, periodic applications will maintain the desired concentration and performance. BaraLube W-511 does exhibit a moderate foaming tendency, laboratory testing must be performed in order to determine the optimal defoamer to use.

Packaging

BaraLube W-511 lubricant is packaged in 1,000 liter (264 gal) IBC tanks.

BaraLube® W-839

LUBRICANT

Product Description

BaraLube® W-839 lubricant is an amide-based additive for the reduction of torque and drag in water-based drilling fluids. BaraLube W-839 lubricant is suitable for a range of drilling fluids, including those containing calcium salts. BaraLube W-839 lubricant is biodegradable and does not fluoresce. BaraLube W-839 lubricant will maintain stability and performance at temperatures up to 400ºF (204ºC).

Applications/Functions

- Reduces metal/metal and metal/rock friction
- Reduces frictional torque and drag
- Improves the lubricating qualities of water-based drilling fluids

Advantages

- Effective in mono- and divalent brines
- High temperature stability
- No adverse effects on drilling fluid stability

Typical Properties

Appearance:	Clear amber liquid
Specific gravity:	0.95
Flash point:	496°F (258°C)

Recommended Treatment

Lubrication can be achieved with concentrations of around 3% v/v BaraLube W-839 lubricant. After initial treatment, periodic applications will maintain the desired concentration and performance.

Caution – BaraLube W-839 lubricant may emulsify oil into water-based fluids. The risk of oil ingress must be assessed and the effects of contamination should be tested

Packaging

BaraLube W-839 lubricant is packaged in 208 liter (55 gal) drums and 1,000 liter (264 gal) IBCs.

BaraLube® W-849

LUBRICANT

Product Description

BaraLube® W-849 lubricant is an amide-based additive for the reduction of torque and drag in water-based drilling fluids. BaraLube W-849 lubricant is suitable for a range of drilling fluids, including those containing calcium salts. BaraLube W-849 lubricant is biodegradable and does not fluoresce. BaraLube W-849 lubricant will maintain stability and performance at temperatures up to 400ºF (204ºC).

Applications/Functions

- Reduces metal/metal and metal/rock friction
- Reduces frictional torque and drag
- Improves the lubricating qualities of water-based drilling fluids

Advantages

- Effective in mono- and divalent brines
- High temperature stability
- No adverse effects on drilling fluid stability

Typical Properties

Appearance:	Clear amber liquid
Specific gravity:	0.95
Flash point:	496°F (258°C)

Recommended Treatment

Lubrication can be achieved with concentrations of around 3% v/v BaraLube W-849 lubricant. After initial treatment, periodic applications will maintain the desired concentration and performance.

Caution – BaraLube W-849 lubricant may emulsify oil into water-based fluids. The risk of oil ingress must be assessed and the effects of contamination should be tested

Packaging

BaraLube W-849 lubricant is packaged in 208 liter (55 gal) drums and 1,000 liter (264 gal) IBCs.

BAROID PRODUCT BULLETIN

January 2015
For Internal Use Only

Contact
Kevin Redfern
Product Manager -
Solids Control Equipment

Michelle Cox
Product Marketing Manager –
Drilling Waste Management

Now Available for Immediate Use

This bulletin features product release information for:
High Performance BaraMesh™ Shale Shaker Screens

Overview

While there are a variety of solids control solutions, shaker screens are the most optimal solution and serve as the operator's first line of defense against reducing solids contamination and maintaining fluid integrity.

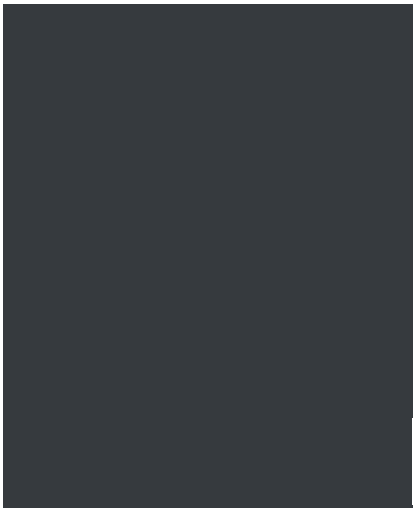
Halliburton Baroid's BaraMesh™ screen cloths are customized per drilling operation and are comprised of a strong, three-layer design that incorporates a larger wire diameter than conventional shaker screens. This design offers a wire aspect ratio (the ratio of length to width of each screen opening) that is more resistant to wear and helps increase the longevity of the screen life. BaraMesh screens are able to support high flow rates, and resist blinding thus reducing waste to haul off volumes.

System Highlights

- High aspect ratio increases conductance and conveyance
- Stainless steel rectangular mesh provides resistance to near size particle blinding
- Increased wire diameter ensures screen longevity

Proper screen selection can help lower costs by:

- Maximizing fluid recovery and minimizing waste volumes
- Ability to withstand aggressive drilling parameters without increasing well AFEs
- Offering an increased longevity of the screen,



operators are able to maintain desired cutpoints
- Lite weight construction facilitates a more safe and efficient method by which screens can be changed

Sales Materials

BaraMesh™ Shale Shaker Screens Sales Data Sheet

The full sales kit will be available for global use soon.

HALLIBURTON
Baroid

BaraMul™ IE-928

EMULSIFIER

Product Description

BaraMul™ IE-928 (formerly BDF™-928) primary emulsifier is a modified tall oil surfactant designed for diesel-based drilling fluid systems. BaraMul IE-928 emulsifier helps stabilize emulsions, improve solids wetting, and reduce HPHT filtration. BaraMul IE-928 emulsifier is a lower-viscosity version of the proven INVERMUL® emulsifier product, and provides equivalent performance in most applications. BaraMul IE-928 emulsifier requires the addition of lime for best performance.

Applications/Functions

- Helps form stable water-in-oil emulsions
- Helps lower filtration rates
- Helps impart high temperature stability to oil-based fluids

Advantages

- Can be added directly to the system
- Lower viscosity than other emulsifier products
- Resists electrolyte contamination

Typical Properties

Appearance:	Dark liquid
Flash point, SETA:	156°F (69°C)
Specific gravity:	0.99

Recommended Treatment

1. For normal applications, add 4-12 lb/bbl (11.41-34.24 kg/m³).

2. For high temperatures (350ºF+), add 10-25 lb/bbl (28.53-71.33 kg/m³).

3. For relaxed-filtrate systems, add 0.25-4.0 lb/bbl (0.71-11.41 kg/m³).

Note: For every pound of BaraMul IE-928 emulsifier that is added to the system, add 0.5 lb/bbl (1.4 kg/m³) of lime. As with other diesel-based fluid systems, supplementing the primary emulsifier with a secondary emulsifier is recommended for best results.

Packaging

BaraMul IE-928 emulsifier is packed in 55-gal drums, 275-gal drums and in bulk.

BaraMul™ IE-1020

EMULSIFIER

Product Description

BaraMul IE™ IE-1020 emulsifier blend provides primary emulsification of the brine phase in non-aqueous fluid (NAF) systems, and oil wetting of system solids. This highly active surfactant also helps to stabilize the rheological properties and lower the HPHT filtrate of oil- or synthetic-based drilling fluids. BaraMul IE-1020 is suitable for use in conventional systems and BaraXcel™ organoclay-free NAF systems.

Applications/Functions

- Provides stable invert emulsions in a range of common base fluids
- Aids in secondary wetting of solids such as weight materials and lost circulation materials
- Stabilizes the fluid after incorporating drill solids and other contaminants

Advantages

- Suitable for use with a wide range of oil and synthetic base fluids
- Fast-acting emulsification
- Stable to temperatures greater than 200°C (392°F)

Typical Properties

Appearance:	Amber liquid
Specific Gravity:	0.96
Pour point:	< -2°C (28°F)

Recommended Treatment

Add 6-16 lb/bbl (17.1-45.6 kg/m^3) of BaraMul IE-1020 to formulate NAF systems. Use levels depend on the desired fluid density, weight material type, brine content and operating temperatures.

Packaging

BaraMul IE-1020 is available in 55-gallon drums containing 190 kg net weight.

BaraMul™ IE-537

EMULSIFIER

Product Description

BaraMul™ IE-537 emulsifier is a highly active emulsifier and oil-wetting agent for non-aqueous drilling fluid systems. It does not need significant additions of lime for activation and is suitable for all invert emulsion systems. BaraMul IE-537 emulsifier contains a small amount of non-aromatic base fluid to enhance cold temperature handling.

Applications/Functions

- Promotes oil-wetting in invert emulsion systems
- Helps to increase electrical stability measurements
- Assists in stabilizing rheological properties for optimum performance

Advantages

- Effective in small concentrations
- Thermally stable at temperatures greater than 500ºF (260ºC)
- Can be used with the full range of diesel, low-aromatic mineral oil and synthetic-based fluids

Typical Properties

Appearance:	Amber liquid
Flash point:	>149°F (65°C)
Specific gravity:	0.96

Recommended Treatment

For typical non-aqueous drilling fluid systems, add 6-16 lb/bbl (17.1-45.6 kg/m³) directly to the system.

Packaging

BaraMul IE-537 emulsifier is packaged in 55-gal (208-l) drums and 275-gal (1041-l) totes.

BaraMul™-947

OIL-IN-WATER EMULSIFIER

Product Description

BaraMul™ -947 emulsifier (formerly BDF-947) is a specialized water-wetting surfactant blend which can emulsify hydrocarbon base fluids into freshwater and brines. The primary application of BaraMul-947 is to create direct emulsion drilling fluids. The amount and type of base fluid incorporated into these systems, as well as the brine density will determine the final density of the emulsion. Lightweight direct emulsion fluids built using BaraMul-947 are often preferred for drilling well sections where underlying depletion or other geological features have led to a weak fracture gradient or low maximum fluid density.

Applications/Functions

- Formulate direct emulsion drilling fluids
- Help to emulsify oil influx

Advantages

- Non-hazardous
- Effective in small concentrations, can emulsify over 40% by volume hydrocarbon base fluid
- Helps to stabilize fluid rheology
- Tolerates salt-saturation and moderate to high hardness levels

Typical Properties

Appearance	Yellow liquid
Flash Point, open cup	> 302°F (150°C)
Specific gravity	1.05-1.10
pH	6-7

Recommended Treatment

Typical treatments of BaraMul-947 emulsifier range from 2.5-8.0 lb/bbl (7.1-22.8kg/m^3). The fluid salinity, amount and type of hydrocarbon base fluid will dictate the optimum concentration.

Packaging

BaraMul-947 emulsifier is packaged in 55-gal (208 ltr) drums.

BaraMul™ IE-672

EMULSIFIER

Product Description

BaraMul™ IE-672 (formerly BDF™-672) emulsifier was specifically designed for BaraECD® organoclay-free High-Performance Invert Emulsion Fluid System. This anionic surfactant creates strong and durable emulsions from a wide variety of base oils. BaraMul IE-672 can act as the sole emulsifier and wetting agent, or may be used with additional surfactant-based additives.

Applications/Functions

- Forms a stable invert emulsion with brine internal phase
- Aids in providing a low, all-oil filtrate
- Assists in building advanced rheology profiles for technically-challenging low-ECD fluid applications

Advantages

- Easily blended into the BaraECD fluid system
- Low pour point for ease of use in cold climates
- Complies with current North Sea environmental regulations

Typical Properties

Appearance:	Amber Liquid
Specific Gravity:	0.94 – 0.97
Flash Point:	>149°F (65°C)
Solubility:	Miscible in Oil

Recommended Treatment

Add a minimum of 8 lb/bbl (22.82 kg/m^3) of BaraMul IE-672 as needed to maintain optimum performance in BaraECD fluid systems. Additional tests should be conducted to define optimum concentration ranges for specific conditions.

Packaging

BaraMul IE-672 is available in 419-lb (190-kg) drums and IBCs.

BaraMul™ IE-932

PRIMARY EMULSIFIER

Product Description

BaraMul™ IE-932 (formerly BDF™-932) emulsifier blend provides primary emulsification of the aqueous phase in invert emulsion fluids. This highly-active surfactant also helps to lower the HPHT filtrate of oil- or synthetic-based drilling fluids. For best results, BaraMul IE-932 should be used with lime in the fluid system.

Applications/Functions

- Provides stable invert emulsions
- Reduces the HPHT filtrate, and helps eliminate free water or brine from the filtrate
- Aids in secondary wetting of solids in the system

Advantages

- Easily blended into invert emulsion fluid systems
- Suitable for use with oil and synthetic base fluids
- Fast-acting emulsification

Typical Properties

Appearance:	Black Liquid
Flash Point:	185°F (85°C)
Solubility:	Insoluble in Water

Recommended Treatment

Add 2-10 lb/bbl (5.7-28.5 kg/m^3) of BaraMul IE-932 as needed to maintain the invert emulsion fluid system. Use 0.25-0.50 lb/bbl of lime for each pound of BaraMul IE-932 added.

Packaging

BaraMul IE-932 is available in bulk and 55-gallon (208.2-L) drums.

BARANEX®

FILTRATION CONTROL ADDITIVE

Product Description

BARANEX® filtration control additive is sulphonated lignite for use in water-based drilling fluid systems. BARANEX filtration control additive is formulated to improve both API and HPHT fluid loss while providing rheology stability over a wide range of temperatures. It functions well in the presence of common mud contaminants such as calcium, magnesium and chloride salts and also across a wide range of pH alkalinities. BARANEX filtration control additive is principally used in higher temperature applications up to 400°F (204°C) to replace basic polymer filtration control additives which lose their functionality at elevated wellbore temperatures. BARANEX filtration control additive can also be used in conjunction with THERMA-CHEK® high temperature polymer filtration control additive for enhanced filtration control performance in high temperature WBM applications.

Applications/Functions

- Provide filtration control at temperatures approaching 400°F (205°C) in water-based drilling fluids
- Replace basic filtration polymers that lose their ability to control HTHP filtration rates at elevated bottom hole temperatures

Advantages

- Helps reduce fluid loss at temperatures approaching 400°F (205°C)
- Does not increase viscosity
- Functions in most water-based drilling fluids
- Solubilizes readily in water
- Helps maintain filtration control in the presence of contaminants of calcium, magnesium, and solids

Typical Properties

- Appearance: Dark brown powder
- pH, (5% aqueous solution): 8.8-9.2
- Specific gravity: 0.98 – 1.2

Recommended Treatment

Add 2-10 lb/bbl (5.7-28.6kg/m^3) to most water-based drilling fluids.

Packaging

BARANEX filtration control additive is packaged in 50-lb. (22.7-kg) sacks.

BaraPerfluid

PERFORATION FLUID

Product Description

BaraPerfluid perforating fluid is a specially formulated water-based system to use during perforating operations to control fluid loss while minimizing formation damage. BaraPerfluid perforating fluid can be engineered to be solids-free or to contain degradable bridging materials. It helps to minimize fluid invasion while perforating in oil or gas bearing zones with an over-balanced fluid.

Applications/Functions

- Lost circulation pill for use during overbalanced perforating operations
- Helps minimize fluid invasion while perforating
- Designed for use with Halliburton's SurgePro™ dynamic underbalance design services and other perforating systems

Advantages

- Easily customized to be solids-free or to contain engineered sized particles such as BaraCarb™ bridging agent to minimize formation damage
- Helps prevent significant losses to the reservoir when perforating overbalanced
- Contains degradable bridging material

Typical Properties

- Appearance: Clear or white viscous fluid
- Fluid density: 8.4 – 19.2 lb/gal (1.0 – 2.3 sg)

Recommended Treatment

Spot across the entire interval to be perforated with some excess volume above the top perforation.

Packaging

Can be supplied premixed or mixed on site with available brine and sacked materials.

BaraPure® Glycol

SHALE STABILIZER

Product Description

BaraPure® Glycol shale stabilizer provides a reduction in the water activity of BaraPure® Salt-Free, High-Performance non-aqueous fluid (NAF) systems. This organic liquid product acts as a salt replacement and creates a hygroscopic internal phase.

Applications/Functions

- Drives lower water activity to achieve wellbore-stabilizing osmotic dehydration effect
- Eliminates the need for chloride-containing salts which can limit waste disposal options

Advantages

- Easily blended into the BaraPure fluid system
- Can be used to modify inhibitive character as hole conditions dictate
- Reduces Health, Safety and Environmental concerns with salts in ecologically sensitive areas
- Biodegradable and non-toxic, contains no chloride ions

Typical Properties

Appearance:	Amber liquid
Specific Gravity:	1.2 – 1.3
Solubility:	Miscible in water

Recommended Treatment

Add BaraPure Glycol as needed to maintain the desired level of water activity in BaraPure fluid systems.

Packaging

BDF-522 is available in 55-gal (208-l) drums and in bulk.

BaraScav™ D

SCAVENGER

Product Description

BaraScav™ D scavenger is a dry powder oxygen scavenger used for corrosion control or thermal extension of water-based fluids. Applications include oxidative corrosion control in down-hole tubulars and reduction of the conditions that promote thermal degradation of organic materials. BaraScav D scavenger is suitable for use in fresh water and monovalent brines. Use in divalent brines is not recommended.

Applications/Functions

» Helps remove soluble oxygen from water-based drilling fluids and monovalent brines

Advantages

» Extends the life of organic polymers and other organic materials, especially at elevated temperatures
» Minimizes oxygen corrosion cell formation
» Helps lower mud maintenance costs
» Effective in small concentrations

Typical Properties

» Appearance	White to off-white powder
» pH, (1% aqueous solution)	9.4
» Specific gravity	2.63

Recommended Treatment

» For initial treatment, add 0.1-0.5 lb/bbl (0.29-1.43 kg/m³) of BaraScav D scavenger.

Note: Regulate treatments by maintaining sulfite residuals of 20-100 mg/l in saturated salt water and up to 300 mg/l in fresh water systems.

Warning: BaraScav D scavenger contains sulfite and is incompatible with ALDACIDE® G and STARCIDE™ biocides, DEXTRID® filtration control agent, and formaldehyde/ paraformaldehyde.

Packaging

BaraScav D scavenger is packaged in 50-lb (22.7-kg) sacks.

BaraScav™ L

SCAVENGER

Product Description

BaraScav™ L scavenger is a liquid oxygen scavenger used for corrosion control of water-based fluids or thermal extension of water-based fluids. Applications include oxidative corrosion control in down-hole tubulars and reduction of the conditions that promote thermal degradation of organic materials. BaraScav L is suitable for use in freshwater and monovalent brines. Use in divalent brines is not recommended due to formation of insoluble calcium sulphite / zinc sulphite. In brackish waters containing free calcium BaraScav L scavenger should be used with a catalyst such as hexametaphosphate or other calcium sequestering agents to achieve optimum results. One gallon of BaraScav L scavenger has similar oxygen scavenging capacity to 10 lbs of BaraScav D scavenger.

Applications/Functions

» Helps remove soluble oxygen from water-based drilling and completion fluids

Advantages

» Minimize oxygen corrosion cell formation
» Extends thermal stability of organic polymers
» Can be added directly to the fluid system

Typical Properties

» Appearance	Clear yellow liquid
» pH, (1% aqueous solution)	5
» Specific gravity	1.34

Recommended Treatment

» For initial treatment, add 0.1-0.5 lb/bbl (0.29-1.43 kg/m³) of BaraScav L scavenger.

Note: Regulate treatments by maintaining sulfite residuals of 20-100 mg/l in saturated salt water systems and up to 300 mg/l in fresh water systems.

Warning: BaraScav L scavenger contains sulfide and is incompatible with ALDACIDE® G and STARCIDE™ biocides, DEXTRID™ filtration control agent, and formaldehyde / paraformaldehyde.

Packaging

BaraScav L scavenger is packaged in 5-gal (18.9-l) pails and 55-gal (208-l) drums.

BaraScav™ W-480

SCAVENGER

Product Description

BaraScav™ W-480 scavenger is a non-sulfite liquid H_2S scavenger for use in all brine and water-based fluid systems. It is particularly well suited for applications involving clear brines. When BaraScav W-480 scavenger reacts with H_2S, the resultant product remains soluble in water; no formation damaging solids are created. BaraScav W-480 scavenger also has biocidal properties, and can reduce the demand for additional biocides in the fluid system. BaraScav W-480 scavenger should not be used with sulfite and bisulfite products.

Applications/Functions

- Particularly suitable for inclusion in clear brine in anticipation of H_2S intake
- For inclusion in drilling fluid and packer fluids in anticipation of H_2S intake
- Can be used in diverse fluids ranging from fresh water to light weight divalent brines

Advantages

- In the case of clear brine, unlike other sulphide scavengers, it will remove the H_2S without producing an insoluble solid in the process
- Provides secondary biocidal action

Typical Properties

Form:	Light yellow/colorless liquid
Specific gravity, at 20°C:	1.16
Flash point:	>212°F (100°C)
pH, (1% aqueous solution):	9 to 12
Solubility:	Water soluble

Recommended Treatment

1. For drilling applications, add 1-2 lb/bbl (2.9-5.7 kg/m^3) to the active fluid system.
2. For packer fluid applications if H2S is expected, for each 1 mg/L of H_2S is expected, add 14 mg/L of BaraScav W-480 scavenger.

Packaging

BaraScav W-480 scavenger is packaged in 55-gal. (208 L) drums and IBC tanks.

BaraScav™ W-635

SCAVENGER

Product Description

BaraScav W-635 scavenger is used to extend the thermal stability of OXYGON™ oxygen scavenger beyond 250°F (121°C).

BaraScav W-635 scavenger will maintain OXYGON function and extend its performance at temperatures up to 500°F (260°C).

Applications/Functions

- Extends oxygen scavenging in drilling, completion, and packer fluids
- Compatible with fresh water, mono- and divalent brines
- Used as part of a corrosion control system

Advantages

- Extends the temperature range of OXYGON oxygen scavenger
- Prevents degradation and production of solids

Typical Properties

Appearance:	Colorless liquid
Specific gravity:	1.0
pH:	10.5
Solubility:	Soluble in water

Recommended Treatment

Packer fluids should be treated with a combination of 0.1 lb/bbl (0.29 kg/m^3) OXYGON oxygen scavenger and 0.5 lb/bbl (1.45 kg/m^3, 0.14% v/v) BaraScav W-635 scavenger. Circulating fluids require regular additions of both products to maintain maximum effectiveness.

Packaging

BaraScav W-635 scavenger is packaged in 275-gal (1,041-l) IBCs.

BaraScav™ W-659

HYDROGEN SULPHIDE SCAVENGER

Product Description

BaraScav™ W-659 liquid-form hydrogen sulphide (H_2S) scavenger is for use in oil-contaminated aqueous slops. BaraScav W-659 hydrogen sulphide scavenger reacts in solution to form stable iron sulphide, aiding in removal of the hazards associated with hydrogen sulphide.

Applications/Functions

- BaraScav W-659 hydrogen sulphide scavenger can be used to treat out H_2S from water-based fluid systems, drilling slops and brines. The use of a biocide in conjunction with the BaraScav W-659 hydrogen sulphide scavenger is an effective combination to help prevent further H_2S formation.

Advantages

- Aqueous solution
- Reduced manual handling
- Very good environmental rating

Typical Properties

Density:	1.48 SG at 20°C
Color:	Dark brown
pH:	7-8 at 20°C

Recommended Treatment

1. Operational conditions such as the fluid type, circulation rate, temperature, and rate of hydrogen sulphide concentration will impact the rate and extent of the scavenging reaction.
2. BaraScav W-659 hydrogen sulphide scavenger should be used as a preventive treatment, although it will remove H_2S from solution.
3. As preventive treatment in slops, use 2.5 - 3.5 lb/bbl (7 – 10 kg/m^3).
4. For treatment of H_2S gas, use the following guideline: 1.75 lb/bbl (5 kg/m^3) BaraScav W-659 scavenger removes approximately 113 mg/l sulphide.

Packaging

BaraScav W-659 scavenger is supplied in 208 liter (308 kg) drums and 1,000 liter (1,480 kg) IBCs.

BaraScav® W-1043

SCAVENGER

Product Description

BaraScav W-1043 scavenger is a highly concentrated non-sulfite liquid H_2S scavenger for use in monovalent brine and water-based fluid systems. It is particularly well suited for completion and workover operations involving clear brines. When BaraScav W-1043 scavenger reacts with H_2S, the resultant product remains soluble in water.

Applications/Functions

- BaraScav W-1043 scavenger is suitable for inclusion in clear brine in anticipation of H_2S ingress
- BaraScav W-1043 scavenger can be used in a wide range of fluids from fresh water to highly concentrated monovalent brines. It is also compatible with a diverse range of typical packer fluid inhibitors

Advantages

- Scavenging efficiency >95% without producing an insoluble solid in the process
- Liquid product facilitates quicker and more efficient mixing at the rigsite compared to powder

Typical Properties

- Appearance: Colorless to pale yellow liquid
- Specific gravity: 1.13 – 1.21
- pH (neat): 11.5 – 12.5

Recommended Treatment

Add 1% v/v BaraScav W-1043 scavenger to clear brine to achieve >95% H_2S scavenging efficiency.

BaraScav W-1043 scavenger should not be used in divalent brines or with sulfite and bisulfite products.

Packaging

BaraScav W-1043 scavenger is packaged in 200 kg drums.

BaraScav® W-1044

SCAVENGER

Product Description

BaraScav W-1044 scavenger is a concentrated non-sulfite liquid H_2S scavenger for use in monovalent brine and water-based fluid systems. It is particularly well suited for completion and workover operations involving clear brines. When BaraScav W-1044 scavenger reacts with H_2S, the resultant product remains soluble in water.

Applications/Functions

- BaraScav W-1044 scavenger is suitable for inclusion in clear brine in anticipation of H_2S ingress
- BaraScav W-1044 scavenger can be used in a wide range of fluids from fresh water to highly concentrated monovalent brines. It is also compatible with a diverse range of typical packer fluid inhibitors

Advantages

- Scavenging efficiency >90% without producing an insoluble solid in the process
- Liquid product facilitates quicker and more efficient mixing at the rigsite compared to powder

Typical Properties

- Appearance: Colorless to pale yellow liquid
- Specific gravity: 1.0 – 1.1
- pH (neat): 11.5 – 12.0

Recommended Treatment

Add 1% v/v BaraScav W-1044 scavenger to clear brine to achieve >90% H_2S scavenging efficiency.

BaraScav W-1044 scavenger should not be used in divalent brines or with sulfite and bisulfite products.

Packaging

BaraScav W-1044 scavenger is packaged in 200 kg drums.

BaraScav™-1061

H_2S SCAVENGER

Product Description

BaraScav-1061 hydrogen sulfide scavenger is a liquid product completely soluble in both water and oil. It is highly effective at low concentrations and forms no insoluble precipitates upon reaction with hydrogen sulfide. BaraScav-1061 is non-toxic and has a pour point of –38°F (-39°C), making it suitable for application in cold climates.

Applications/Functions

- Scavenges hydrogen sulfide gas from sour formations in all drilling fluid types

Advantages

- Effective at very low concentrations
- Functions in oil- and water-based fluids
- No formation of insoluble precipitates makes this treatment reservoir-friendly
- Liquid product for easy handling

Typical Properties

Appearance:	Colorless to light yellow liquid
Solubility:	Soluble in water and oil
Flash point:	> 212°F (> 100°C)
Pour point:	–38°F (-39°C)

Recommended Treatment

BaraScav-1061 should be added to the drilling fluid at a concentration of 0.5 – 1.0 lb/bbl (1.43 – 2.85 kg/m^3), or as needed based on knowledge of the sour gas contents of the formation being drilled.

1.0 lb/bbl (2.85 kg/m^3) BaraScav-1061 can scavenge approximately 670 ppm hydrogen sulfide.

Packaging

BaraScav-1061 is available in 55-gal (208-L) drums and 5-gal (18.9-L) pails.

BaraScrub™

CASING CLEANER

Product Description

BaraScrub™ casing cleaner is used to remove oil based mud residues during displacements. BaraScrub casing cleaner is highly efficient and can be used in smaller pill sizes than surfactants which helps reduce clean-up waste volume. BaraScrub casing cleaner contains a mixture of natural solvents obtained from renewable sources.

Applications/Functions

- Removes oil-wet solids from casing walls.
- Intended use is in displacing diesel-based, mineral-oil-based, and synthetic-based drilling fluids.

Advantages

- Helps decrease clean up time
- Effective in diesel-based, mineral oil-based, and synthetic-based drilling fluids
- Miscible in oil

Typical Properties

Appearance	Colorless to straw-colored liquid
Flash point, TCC	115°F (46°C)
Specific gravity	0.84
Odor	Mild citrus

Recommended Treatment

BaraScrub casing cleaner is most effective for displacements when applied neat with a two to five minute contact time. BaraScrub is insoluble in water and cannot be diluted or mixed with completion brine as a spacer. For optimum performance, contact your Baroid representative for a complete displacement program.

Packaging

BaraScrub casing cleaner is packaged in 55-gal (208-l) drums containing 385-lb (175-kg) net weight.

BaraSeal™ IE-957

WELLBORE SEALANT

Product Description

BaraSeal™ IE-957 (formerly BDF™-957) wellbore sealant is a proprietary polymer which was designed to provide rapid stabilization of microfractures and porous zones in non-aqueous drilling fluid systems. The small deformable particles combine with existing solids and sized particulate materials in the fluid to effectively seal off openings of approximately 20-100 microns in size. BaraSeal IE-957 helps to lower filtrate volumes on particle plugging tests which use slots and alloxite disks.

Applications/Functions

- Helps seal microfractures and permeable zones to reduce downhole losses
- Aids in stabilization of weak and fractured formations
- Contributes to very low spurt loss when maintained at sufficient dosages
- May be used to replace older sealing products sourced from asphalt

Advantages

- Highly effective at low concentration levels
- Compatible with all fluid types; approved for use in BaraXcel™ and BaraECD® fluid systems
- Minimal effects on rheological properties and gel strengths compared to other products
- Stable to temperatures over 250ºF (121ºC)

Typical Properties

Appearance:	White powder
Specific Gravity:	0.90-0.98

Recommended Treatment

Add 2-8 lb/bbl (5.7-22.8 kg/m^3) of BaraSeal IE-957 as needed to maintain low to zero spurt loss in the fluid system. The optimum concentration is dependent upon the formation, drilling and dilution rates and the makeup of the fluid.

Packaging

BaraSeal IE-957 is available in 25-kg bags.

BaraSeal™ W-1040

FILTRATION CONTROL / SEALING AGENT

Product Description

BaraSeal™ W-1040 (formerly BDF™-1040) sealing agent is a nano particle sized liquid polymer latex which can enhance the sealing properties of water-based drilling fluids. The product contains deformable synthetic polymer particles dispersed in water. These particles help generate more cohesive filter cakes which can efficiently plug and seal off permeable formations, micro-fractures and pore throats. BaraSeal W-1040 is recommended for water-based fluids based on freshwater to near-saturated salinity levels.

Applications/Functions

- Used to formulate low-invasion drilling fluids
- Helps to reduce spurt loss and overall filtrate
- Improves particle-plugging test results with high differential pressures

Advantages

- Easily mixed into existing fluids with fast dispersion
- Particle size ranges between 100-200 nanometers
- Stable to changes in pH, common contaminants and well temperatures reaching over 302ºF (150ºC).
- Functions across a wide range of formation permeability, and can be combined with other products to help seal higher perms
- Helps to improve wellbore stability by reducing filtrate invasion

Typical Properties

Appearance:	White liquid
Flash Point, PMCC:	> 100°C
Specific gravity:	1.00-1.20
pH:	6.5-8.5

Recommended Treatment

Typical treatments of BaraSeal W-1040 range from 1.0 to 4.0% by volume. Higher treatment levels may result in moderate fluid viscosity increases.

Packaging

BaraSeal W-1040 is packaged in 55-gal (208-L) drums and IBC totes.

BaraShield®-663

LOST CIRCULATION MATERIAL

Product Description

BaraShield®-663 premium fine-sized granular multi-modal lost circulation material (LCM) is used to provide wellbore stability in any fluid type and is applicable in any formation, but not intended for reservoir applications. Its proprietary, engineered particle formulation is designed to rapidly seal pores and fractures up to at least 500 microns. BaraShield-663 LCM is designed to be used as a continuous LCM treatment in the whole drilling fluid, when shakers are equipped with API #30 screens, or larger.

Applications/Functions

- Prevent losses to unconsolidated sand and highly permeable formations
- Applicable for sealing microfractured shale or coal
- Applicable for when drilling into naturally fractured formations (partial loss-prone areas)
- Applicable in deepwater wells and depleted formations

Advantages

- Engineered, composite solution to provide a proactive approach to wellbore stability
- Forms strong, thin, low permeability barrier along face of the wellbore to prevent pressure transmission
- Reduces cavings and hole enlargement
- Increased rig-floor efficiency:
    - Reduces footprint on rig floor
    - Lowers costs associated with excess inventory and space
    - Minimizes time to cut and mix sacks from different pallets
    - Helps reduce HSE incidents and waste with less sacks to lift and cut

Typical Properties

Appearance:	Grey particles
Solubility:	At least 33% acid soluble
Specific gravity:	1.6-2.0

Recommended Treatment

For plugging pores, typical concentrations should be around 10 lb/bbl. For sealing fractures up to 500 microns, typical concentrations should be around 20-40 lb/bbl.

Packaging

BaraShield-663 LCM is packaged in 50 lb (22.7 kg) sacks.

BaraShield®-664

LOST CIRCULATION MATERIAL

Product Description

BaraShield®-664 medium-sized granular multi-modal lost circulation material (LCM) is used to prevent or remediate seepage to partial lost circulation in any fluid type and is applicable in any formation, but not intended for reservoir applications. Its proprietary, engineered particle formulation is designed to rapidly seal fractures up to at least 1,000 microns. BaraShield-664 LCM is designed to be used as a continuous LCM treatment in the whole drilling fluid, when shakers are equipped with API #18 screens, or larger.

Applications/Functions

- Prevent losses to unconsolidated sand and highly permeable formations
- Applicable for when drilling into naturally fractured formations (partial loss-prone areas)
- Remedial pill treatments can be enhanced with addition of BaraLock®-666 (.F, .M, .C) LCM

Advantages

- Engineered, composite solution to prevent and remediate seepage to partial lost circulation
- Increased rig-floor efficiency:
  - Reduces footprint on rig floor
  - Lowers costs associated with excess inventory and space
  - Minimizes time to cut and mix sacks from different pallets
  - Helps reduce HSE incidents and waste with less sacks to lift and cut

Typical Properties

Appearance:	Grey particles
Solubility:	At least 33% acid soluble
Specific gravity:	1.6-2.0

Recommended Treatment

For sealing fractures up to 1,000 microns, typical concentrations should be around 40 lb/bbl. For sweep pill applications, add 0.5 lb/bbl of BaraLock-666 LCM to 40 lb/bbl of BaraShield-664 LCM.

Packaging

BaraShield-664 LCM is packaged in 50 lb (22.7 kg) sacks.

BaraShield® -679

LOST CIRCULATION MATERIAL

Product Description

BaraShield®-679 lost circulation material is a customized blend of different sized ground marble lost circulation material (LCM) used to prevent or remediate seepage to partial lost circulation in any fluid type. It is applicable in any formation and for reservoir intervals since it is 100% acid soluble. BaraShield-679 can be used on its own or in conjunction with other lost circulation materials such as STEELSEAL® or BARACARB® products.

Applications/Functions

- Prevent losses to unconsolidated sand and highly permeable formations

Advantages

- Prevents and/or remediates lost circulation in any fluid type
- Engineered blend of particle sizes supplied in bulk reduces number of individual sacks required on location
- Suitable for use in reservoir intervals

Typical Properties

- Appearance: White powder
- Specific gravity: 2.7

Recommended Treatment

Typical pill concentrations of 40 – 100 lb/bbl (114 – 285 kg/m^3) are recommended to reduce and stabilize loss rates. BaraShield-679 lost circulation material can be used on its own or in combination with other products such as any grade STEELSEAL® or BaraShield-981 products.

Packaging

BaraShield-679 lost circulation material is available in bulk.

BaraShield®-981

LOST CIRCULATION MATERIAL

Product Description

BaraShield®-981 premium multi-modal lost circulation material (LCM) is used to provide wellbore stability in any fluid type and is applicable for porous and fractured formations. It is not intended for reservoir applications. Its proprietary, engineered particle formulation is designed to rapidly seal pores and fractures up to 500 microns. BaraShield- 981 LCM is intended to be used as a continuous LCM treatment in the whole drilling fluid, when shakers are equipped with API #60 screens or larger.

Applications/Functions

- Prevent losses to unconsolidated sand and highly permeable formations
- Applicable for sealing microfractured shale or coal
- Applicable for when drilling into naturally fractured formations (partial loss-prone areas)
- Applicable in deepwater wells and depleted formations

Advantages

- Engineered, composite solution to provide a proactive approach to wellbore stability
- Forms a strong, thin, low permeability barrier along the face of the wellbore to prevent pressure transmission
- Reduces cavings and hole enlargement
- Increased rig-floor efficiency:
    - Highly efficient engineered particulate blend LCM
    - Single product reduces storage requirements vs. carrying multiple LCM types
    - Saves time to prepare fluid to achieve proper LCM loading

Typical Properties

Appearance:	Grey particles
Retention on # 60 sieve	Maximum 10% by mass
Solubility:	At least 33% acid soluble
Specific gravity:	1.85-1.95

Recommended Treatment

For plugging pores, typical concentrations should be around 10 lb/bbl (29 kg/m^3). For sealing fractures up to 500 microns, typical concentrations should be around 20-30 lb/bbl (57-86 kg/m^3).

Packaging

BaraShield-981 LCM is packaged in 50 lb (22.7 kg) sacks.

BaraShield®-982

LOST CIRCULATION MATERIAL

Product Description

BaraShield®-982 premium multi-modal lost circulation material (LCM) is used to provide wellbore stability in any fluid type and is applicable for highly porous and fractured formations. It is not intended for reservoir applications. Its proprietary, engineered particle formulation is designed to rapidly seal large pores and fractures up to 1000 microns (1 millimeter). BaraShield- 982 LCM is intended to be used as a continuous LCM treatment in the whole drilling fluid, when shakers are equipped with API #40 screens or larger.

Applications/Functions

- Prevent losses to unconsolidated sand and highly permeable formations
- Applicable for sealing microfractured shale or coal
- Applicable for when drilling into naturally fractured formations (loss-prone areas)
- Applicable in deepwater wells and depleted formations

Advantages

- Engineered, composite solution to provide a proactive approach to wellbore stability
- Forms a strong, thin, low permeability barrier along the face of the wellbore to prevent pressure transmission
- Reduces cavings and hole enlargement
- Increased rig-floor efficiency:
    - Highly efficient engineered particulate blend LCM
    - Single product reduces storage requirements vs. carrying multiple LCM types
    - Saves time to prepare fluid to achieve proper LCM loading

Typical Properties

Appearance:	Grey particles
Retention on # 40 sieve	Maximum 10% by mass
Solubility:	At least 33% acid soluble
Specific gravity:	1.85-1.95

Recommended Treatment

For plugging pores, typical concentrations should be around 20 lb/bbl (57 kg/m^3). For sealing fractures up to 1000 microns, typical concentrations should be around 40-50 lb/bbl (114-143 kg/m^3).

Packaging

BaraShield-982 LCM is packaged in 50 lb (22.7 kg) sacks.

BaraSorb®

BRINE CONDITIONER

Product Description

BaraSorb® oil absorbent is a completion brine filtration additive used during the brine filtration process to reduce the oil and grease content of completion brines to comply with local area regulations. Environmental regulations limit the amount of oil and grease content in fluid discharges in certain geographical regions. BaraSorb oil absorbent helps minimize environmental risk and disposal costs by reducing the oil and grease content of completion brines. BaraSorb oil absorbent is compatible with all standard completion brine types.

Applications/Functions

- Used in normal oilfield diatomaceous earth filtration processes to reduce the oil and grease content of completion fluids.

Advantages

- System maintenance of oil and grease content
- Treatment of oil and grease contaminated fluids
- Onsite screening for increased compliance confidence
- Quicker decision making
- Real-time assessment of NPDES discharge limitations provides a higher degree of assurance

Typical Properties

Appearance	White powder
Bulk Density	5.7lb/ft³ (91.5kg/m³)
Wet Density	8.6lb/ft³ (138.1kg/m³)
Moisture Content	< 8% by wt.

Recommended Treatment

BaraSorb oil absorbent is added with diatomaceous earth in typical ratios of one (1) part BaraSorb oil absorbent per three to five (3 to 5) parts diatomaceous earth.

Total minimum BaraSorb oil absorbent required can be calculated by the following formula:

- For BaraSorb oil absorbent material, lb Xlb. = .00008337 (O) (Vbbl)
- For BaraSorb oil absorbent material, kg Xkg = .0002384 (O) (Vm³)
- Where O = Volume of oil & grease, mg/l Vbbl = Volume of brine, bbl Vm³ = Volume of brine, m³

Packaging

BaraSorb oil absorbent is packaged in 15-lb (6.8-kg) bags.

BaraSpot-581

PIPE-FREEING AGENT

Product Description

BaraSpot-581 pipe-freeing agent is a liquid blend of components designed to be mixed with brine and pumped downhole to dissolve any acid-soluble materials causing differential sticking of downhole tubulars. In the event of stuck pipe it is common practice to pump live acid to free the pipe, but live acid can be spent prior to reaching the stuck pipe location. Once the BaraSpot-581 pipe-freeing agent is mixed in brine, it releases acid over time to facilitate placement of the product prior to acid generation. Other components in the blend help to break emulsions and significantly reduce friction between pipe and casing or formation.

Applications/Functions

- Frees differentially stuck pipe across carbonate formations or in muds containing carbonate bridging material
- Can be used in oil-based mud or water-based mud
- Product comprises delayed action acid, lubricant and emulsion breakers

Advantages

- Much lower HSE impact than the use of live acid
- Can be placed before the acid is released, maximizing its effect
- Contains emulsion breakers to improve acid action in oil-based mud
- Can be mixed with most brines
- Contains components to reduce friction between drill-string and casing or wellbore

Typical Properties

Appearance:	Slightly viscous colorless fluid
Specific Gravity:	1.15

Recommended Treatment

To be mixed with brine at 20% by volume and pumped into position over the stuck zone.

Allow adequate time for action, four to ten hours may be required depending on temperature.

Packaging

BaraSpot-581 pipe-freeing agent is packaged in 200-lb (90.7-kg) drums, 463-lb (210-kg) drums and in bulk.

BaraSpot™-1025

PIPE-FREEING AGENT

Product Description

BaraSpot™-1025 pipe-freeing agent is a liquid blend of components designed to be mixed with fresh water or brine or as part of a solids-laden pill and pumped downhole to reduce friction between the drill pipe and casing or formation. BaraSpot-1025 also helps to reduce bit-balling tendencies in water-based drilling fluids.

Applications/Functions

- Helps free stuck pipe
- Helps reduce bit-balling tendencies

Advantages

- Can be mixed with any water-based fluid or brine
- Minimal HSE impact compared to caustic pills and live acid treatments.

Typical Properties

- Appearance: Yellow to brown liquid
- Specific gravity: 1.01 – 1.02
- pH: 6.5 - 9

Recommended Treatment

To be mixed with brine or into a solids-laden water-based pill at 20 – 50% v/v and pumped into position over the stuck zone.

Packaging

BaraSpot-1025 pipe-freeing agent is packaged in 55-gal (208-l) drums.

BaraSure™ W-674

SHALE STABILIZER

Product Description

BaraSure™ W-674 shale stabilizer is a concentrated organic clay inhibitor for polymer-based drilling, workover and completion fluids. BaraSure W-674 is completely water soluble, environmentally acceptable and may be used in freshwater, seawater, low-solids or weighted systems.

Applications/Functions

- Effective clay inhibitor for formations with high smectite and smectite/illite mixed-layer clay content
- Limits cuttings dispersion
- Minimizes accretion potential

Advantages

- Prevents clay swelling caused by water molecule invasion
- Small ionic radius, allowing easy substitution on exchange sites for the sodium ion - blocking hydration
- Product concentration can be accurately determined in the field or laboratory (Fann test kit required)
- Meets North Sea discharge regulations

Typical Properties

Appearance:	Liquid
Specific gravity:	1.0 – 1.1
Pour Point:	< 23°F (< -5°C)
pH 5% solution:	9.5 (approx.)

Recommended Treatment

BaraSure W-674 is designed to be used at a pH range of 11.5 or less. For optimum results, an initial treatment of 1-3% (v/v) is recommended. Pilot testing is always recommended to determine proper treatment to achieve desired fluid properties. For DRIL-N applications, use N-VIS, BARAZAN or BARAZAN D as the viscosifier in formulations containing potassium chloride (KCl).

Packaging

BaraSure W-674 is packaged in 55 gal drums (208 L) and 264 gal (1000 L) IBC tote tanks.

BaraSure™ W-976

SHALE STABILIZER

Product Description

BaraSure™ W-976 (formerly named BDF™-976) shale stabilizer is a concentrated liquid blend of amine salts used in water-based drilling and completion fluids. It is suitable for most polymer-based and low solids water based fluid systems. BaraSure W-976 shale stabilizer should not be used with fluids containing clay-based viscosifiers since it will prevent clay yield and viscosity build, and may cause flocculation in existing non-dispersed fluid systems.

Applications/Functions

- BaraSure W-976 shale stabilizer can be used to inhibit clay swelling and shale hydration

Advantages

- High efficiency stabilizer for swelling clays and mixed layer clay/shale minerals
- Helps improve drill solids removal
- Effective in fresh water, sea water, salt water, lime, and low solids systems
- Helps reduce the potential for bit balling

Typical Properties

Appearance:	Clear Yellow Liquid
Pour Point:	-31°F (-35°C)
Solubility:	Water Soluble
Specific gravity:	1.05

Recommended Treatment

Add 2.0 -10.5 lb/bbl (5.7 -30 kg/m³) of BaraSure W-976 shale stabilizer directly to the active fluid system

Packaging

BaraSure W-976 shale stabilizer is available in 55-gal (208.2-L) drums.

BaraSure™ W-988

SHALE STABILIZER

Product Description

BaraSure™ W -988 shale stabilizer is a cationic amine compound used to inhibit hydration of reactive clays and shale formations. It is effective in most water-based drilling fluids from fresh water to high salinity brines. BaraSure W-988 shale stabilizer helps reduce the potential for bit balling/accretion and swelling of clay-rich formations, and increases system tolerance to reactive drill solids.

Applications/Functions

BaraSure W -988 shale stabilizer can be used to inhibit clay and shale hydration with or without added salts

Advantages

- Highly-active composition, functions well at full pH range (9-11)
- Product concentration can be accurately determined in the field and laboratory (Fann test kit required)
- Helps improve drill solids removal
- Effective in fresh water, sea water, KCl brine, NaCl brine, lime, and low solids systems
- Water-soluble and non-hazardous

Typical Properties

Appearance:	Transparent yellow liquid
pH:	6-8
Specific Gravity:	1.05 to 1.15

Recommended Treatment

Since BaraSure W-988 shale stabilizer quickly adheres to reactive sites on clays, it provides peak performance in polymer-based fluids with low solids content. Systems containing AQUAGEL® or other bentonite products should be fully pre-hydrated before making additions of BaraSure W-988.

For optimum treatment add 3.5 - 10.5 lb/bbl (10 – 30 kg/m^3) of BaraSure W-988 shale stabilizer.

Packaging

BaraSure W -988 shale stabilizer is packaged in 55-gallon (208-L) drums.

BaraSure™ W-546

SHALE STABILIZER

Product Description

BaraSure™ W-546 (formerly BDF™-546) shale stabilizer is a mixed dry product that incorporates two shale stabilizing agents to provide superior clay inhibition at a very low concentration. BaraSure W-546 shale stabilizer is designed to be used in SHALEDRIL® fluid systems utilized for drilling reactive clay and shale. BaraSure W-546 shale stabilizer can be used in low solids non-dispersed (LSND) and low clay SHALEDRIL systems, but is incompatible with divalent brines. If used with sea water, or brackish make-up water, total hardness should be lowered below 600 ppm prior to the introduction of BaraSure W-546 shale stabilizer.

Applications/Functions

- Used in water based SHALEDRIL systems to provide inhibition and stabilization of highly reactive clay and shale formations
- Can be used in seawater, fresh water and monovalent brines
- Helps seal pores and micro-fractures in the formation
- Helps reduce bit-balling and accretion tendencies

Advantages

- Can provide inhibition performance similar to oil-based fluid systems in a water based system
- Contains no hydrocarbon or synthetic oils
- Can be used in applications up to 350°F (177°C)

Typical Properties

Appearance:	White Powder
pH, (10% aqueous solution):	12.3
Bulk Density:	0.43 lb/ft^2
Solubility:	Water Soluble

Recommended Treatment

Add 1.5-6.5 lb/bbl (4.3-18.5 kg/m^3) of BaraSure W-546 shale stabilizer per finished barrel of fluid

Control LSG <7% v/v. BaraSure W-546 shale stabilizer can be added while drilling highly reactive clays and stopped while drilling sand packages. BaraSure W-546 shale stabilizer can be depleted when drilling anhydrite, green cement calcium chloride, or when exposed to H_2S or CO_2.

Total hardness should be lowered below 600 ppm prior to the introduction of BaraSure W-546 shale stabilizer

Packaging

BaraSure W-546 shale stabilizer is packaged in 50-lb (22.7-kg) sacks.

BaraSure™ W-590

SHALE STABILIZER

Product Description

BaraSure™ W-590 (formerly BDF™-590) shale stabilizer is used to inhibit the hydration of formations containing reactive clays and shales. It is effective in the majority of water-based drilling fluids, from freshwater to high salinity at temperatures up to 400°F (204°C). The optimal mode of use of the BaraSure W-590 shale stabilizer is - pH 7 - 10, but it is also effective in the lime muds. BaraSure W-590 shale stabilizer helps reduce bit-balling and improves drill solids removal. When using the BaraSure W-590 shale stabilizer together with thickeners based on bentonite, the bentonite should be pre-hydrated before it's added into the drilling mud. BaraSure W-590 shale stabilizer can effectively be used instead of potassium chloride in drilling fluids for production intervals..

Applications/Functions

BaraSure W-590 shale stabilizer can be used to inhibit reactive clays and shale hydration.

Advantages

- Helps reduce the potential for bit-balling
- Helps improve drill solids removal
- Effective in fresh water, sea water, salt water, lime, and low solids systems
- Fully soluble in water
- Can replace potassium chloride in pay zones

Typical Properties

Appearance:	Transparent yellow liquid
Specific gravity:	1.1 – 1.2

Recommended Treatment

Recommended concentration of BaraSure W-590 shale stabilizer is 4-7 lb/bbl (11.4-20 kg/m^3).

Note: In case of using bentonite as a viscosifier with BaraSure W-590 shale stabilizer, it is necessary to pre-hydrate bentonite before adding into the mud system.

Packaging

BaraSure W-590 shale stabilizer is packaged in 230-l (276-kg) steel drums.

BaraSurf™-442

FILTER CAKE BREAKER

Product Description

BaraSurf™-442 filter cake breaker is an acid compatible cleaner for removal of filter cake from non-aqueous reservoir drilling fluids. BaraSurf-442 filter cake breaker is suitable for divalent brines and is designed to work with acid to change the wettability of the solids in the filter cake from oil-wet to water-wet while the acid dissolves carbonates in the filter cake in a single step. BaraSurf-442 filter cake breaker can be used with live acid or N-FLOW™ delayed acid generators.

Applications/Functions

- Used as a wash treatment in conjunction with acid to clean oil-based filter cake solids
- This surfactant is not part of the drill-in fluid formulation thereby minimizing probability of whole fluid inversion
- With acid, the clean-up will render the well-bore water wet
- Facilitates wellbore cleanup, thereby reducing rig time and broadening use of oil based drill-in fluids

Advantages

- Acid compatible
- Aids removal of non-aqueous filter cake
- Reduces lift off pressure
- Can be used with live acid or N-FLOW delayed acid generators
- Can be used in divalent brines

Typical Properties

Appearance	Clear liquid
Freezing point	< 27°F (< 3.0°C)
Flash point	> 201°F (> 94°C)
Specific gravity	1.04

Recommended Treatment

- Use in combination with live acid or N-FLOW delayed acid generators. Add 0.25% to 2.5% (v/v) to filtercake breaker to be used for treating the wellbore. For best results, use between 1 and 2.5 % (v/v). Recommended for high salinity brines.

Packaging

BaraSurf-442 filter cake breaker for oil-based drill-in fluids is available in 55-gal (208-l) drums.

BaraSurf™-443

FILTER CAKE BREAKER

Product Description

BaraSurf™-443 filter cake breaker is an acid compatible cleaner for removal of filter cake from non-aqueous reservoir drilling fluids. BaraSurf-443 filter cake breaker is suitable for low salinity brines and fresh water. BaraSurf-443 filter cake breaker is designed to work with acid to change the wettability of the solids of the filter cake from oil-wet to water-wet while the acid dissolves carbonates in the filter cake in a single step. BaraSurf-443 is incompatible with divalent brines, BaraSurf-442 should be used instead. BaraSurf-443 cleaner can be used with live acid or N-FLOW™ delayed acid generators.

Applications/Functions

- Used as a wash treatment in conjunction with acid to clean oil-based filter cake solids
- This surfactant is not part of the drill-in fluid formulation thereby minimizing probability of whole fluid inversion
- With acid, the cleanup will render the wellbore water wet
- Facilitates wellbore cleanup, thereby reducing rig time and broadening use of oil-based drill-in fluids

Advantages

- Acid compatible
- Removes non-aqueous filter cake
- Reduces lift off pressure
- Leaves formation water wet
- Can be used with live acid or N-FLOW delayed acid generators
- Can be used in fresh water or monovalent brine

Typical Properties

Appearance	Pale yellow liquid
Specific gravity	1.04
Pour point	60°F (15.5°C)
Flash point	> 212°F (> 100°C)

Recommended Treatment

Use in combination with live acid or N-FLOW delayed acid generators. Add 0.25% to 2.5% (v/v) to filtercake breaker to be used for treating the wellbore. For best results, use between 1 and 2.5 %(v/v)

Packaging

BaraSurf-443 filter cake breaker for oil-based drill-in fluids is available in 55-gal drums (441 lbs).

BARATHIN-PLUS®

THINNER

Product Description

BARATHIN-PLUS® thinner is a highly effective deflocculant / thinner designed for use across a broad pH range as low as 8.5. BARATHIN-PLUS thinner competes effectively with tannin based thinners and is operable in fresh, saline or saturated salt water-based drilling fluids. It helps to control rheological and filtration properties in fluids with calcium or cement contamination. BARATHIN-PLUS thinner may be used to maintain lightly or fully dispersed drilling fluids. BARATHIN-PLUS thinner is environmentally responsible and is suitable for use at temperatures up to 350°F (177°C).

Applications/Functions

- Helps provide control of gel strengths and flow properties in non-dispersed and lightly dispersed systems while maintaining hole cleaning capabilities
- Helps control rheology in fresh water, sea water and salt water drilling fluid systems
- Helps control filtration rates of water-based drilling fluids at temperatures up to 350ºF (177º C)
- Can effectively treat contamination from salt, cement, anhydrite, drilled solids

Advantages

- Specifically designed for low pH operations (8.5 – 9.5)
- Highly effective in small concentrations (0.1 – 0.25 ppb)
- Imparts tolerance to a wide variety of solid and mineralogical contaminants
- Temperature stable to 350ºF (177ºC)
- Contains no concentrations of chrome

Typical Properties

- Appearance: Brown-gold powder
- pH, (5% aqueous solution): 5.1
- Bulk Density, compacted: 44lb/ft³ (705kg/m³)
- Bulk Density, uncompacted: 22lb/ft³ (352kg/m³)

Recommended Treatment

1. To maintain non-dispersed system, 0.1 - 0.25 lb/bbl to control gel strengths.
2. To maintain a lightly dispersed system, 0.5 - 2.0 lb/bbl to control flow properties and filtration rates.
3. To maintain a fully dispersed system, 2.0 - 4.0 lb/bbl with appropriate pH at increasing levels as warranted.
4. To restore flow properties and filtration control after contamination, 2.0 - 8.0 bbl.

Packaging

BARATHIN-PLUS thinner is packaged in 25-lb (11.3 kg) sacks.

BaraVis® IE-568

VISCOSIFIER

Product Description

BaraVis® IE-568 viscosifier provides increased low end rheology in invert emulsion systems. The product also imparts a strong, but easily broken gel in organophilic clay free fluids. The product can be used in conjunction with TAU-MOD® viscosifier for even greater effect. BaraVis IE-568 viscosifier can be used in deep water and HTHP fluid applications.

Applications/Functions

- Helps increase low shear rheology
- Helps improve emulsion stability
- It can be used in systems formulated with or without organophilic clay
- Documented effect at temperatures beyond 400°F (204°C)
- Minimal cold temperature rheology in organophilic clay free systems

Advantages

- Is not a clay based material
- Increases low shear rheology
- Helps impart strong, but easily broken gels in organophilic clay free and BaraECD® fluids
- Yellow rated for Norway

Limitations

The optimum treatment level should be determined through specific testing to customize the fluid.

Typical Properties

Appearance:	Dark amber liquid
Specific Gravity:	0.93 – 1.03
Pour point:	>32°F (0°C)

Recommended Treatment

Add 0.25-3.5 lb/bbl (0.7-10 kg/m^3)

Packaging

BaraVis IE-568 viscosifier is available in 55-gal (208-L) drums, containing 195 kg net weight, and 1000-L IBCs.

BaraVis® IE-989

VISCOSIFIER

Product Description

BaraVis® IE-989 viscosifier provides fragile gel strengths and increased low shear rheological properties in invert emulsion systems. The product meets environmental regulations for North Sea areas, and was designed for service in organophilic clay free fluids. BaraVis IE-989 viscosifier can be used in deep water and HTHP fluid applications.

Applications/Functions

- Helps increase low shear rheology
- Promotes gel strength for improved hole cleaning and suspension of weight materials
- Used in BaraECD® and BaraXcel™ fluid systems

Advantages

- Highly active, with low pour point
- Yellow rated for Norway

Limitations

Optimum treatment levels should be determined through specific fluid customization testing.

Typical Properties

Appearance:	Dark amber liquid
Specific Gravity:	0.93 – 0.94
Pour point:	<14°F (-10°C)

Recommended Treatment

Add 0.25-3.5 lb/bbl (2.85-10 kg/m^3)

Packaging

BaraVis IE-989 viscosifier is available in 55-gal (208-L) drums, containing 195 kg net weight, and 1000-L IBCs.

BaraVis® W-538

VISCOSIFIER

Product Description

BaraVis W-538 viscosifier is a synthetic hectorite material. BaraVis W-538 is the primary viscosifier of the highly thixotropic GeoBalance® spacer technology used to prevent comingling of heavy and light fluids while tripping during MPD operations. It is incompatible with saline environments and must never be mixed in brine or seawater. A secondary viscosifier, TAU-MOD®, should be used at a concentration of 7 – 9 lb/bbl (20 – 25.7 kg/m^3) to counter low levels of ionic contamination (see below for more details).

Applications/Functions

- Primary viscosifier for GeoBalance spacer applications

Advantages

- Maintains stable rheology over wide temperature range
- Shear thinning
- Does not flocculate at high temperature

Typical Properties

- Appearance: White powder
- Specific gravity: 2.5

Recommended Treatment

Add 9 – 12 lb/bbl (26 – 34.2 kg/m^3) BaraVis W-538 viscosifier to the base fluid, yield for minimum 15 minutes before adding the remaining components of the GeoBalance spacer.

Note: base fluid must have chloride content <800 mg/L and total hardness < 100 mg/L before adding BaraVis W-538 for a successful application.

Excessive soda ash affects the final gel strength; always determine the hardness of the source water in advance and pilot test before making large-scale mixes. Refer to GeoBalance field guidelines for more information.

Packaging

BaraVis W-538 viscosifier is packaged in 5 gallon (18.9 liter) pails containing 55 lbs (25 kg).

BaraVis® W-638

VISCOSIFIER

Product Description

BaraVis® W-638 viscosifier is a proprietary synthetic polymer additive. The structure of BaraVis W-638 features strongly bonded chemical linkages and cross-linked chains which deliver exceptional high temperature stability. BaraVis W-638 is intended as the primary viscosifier and filtration control agent for the BaraDrilN™ X HPHT drill-in fluid system. BaraVis W-638 is also suitable for sweeps, spacers and fluid loss control pills when stability and performance has to be maintained under HPHT conditions. BaraVis W-638 will maintain rheology, suspension and hole cleaning performance under extended HPHT exposure. BaraVis W-638 is designed to viscosify divalent brines to deliver high density fluids whilst avoiding the use of potentially damaging solids.

Applications/Functions

- Viscosifier for BaraDrilN X HPHT drill-in fluid system
- Viscosifier for divalent fluid systems
- High temperature drilling, completion and workover operations

Advantages

- Fully compatible with divalent brines
- Long term stability up to 425ºF (218ºC)
- Maintains reservoir permeability protection

Typical Properties

Appearance	White powder
Flash Point	>212ºF (>100ºC)
Bulk density, compacted	15 lb/ft^3 (240 kg/m^3)

Recommended Treatment

BaraVis W-638 is designed to be used in the BaraDrilN X drill-in fluid but may be specified for other HPHT duties. BaraVis W-638 and solids suspension applications require an initial loading of 6-12 lb/bbl (17-34 kg/m^3) BaraVis W-638 polymer. Although BaraVis W-638 will viscosify monovalent brine, the thermal stability of the polymer is maximized in calcium chloride and bromide brines. Pilot testing should be conducted for all applications in order to demonstrate suitable fluid performance.

Packaging

BaraVis W-638 viscosifier is packaged in 10kg drums (22 lb).

BaraVis® W-967

VISCOSIFIER/SUSPENSION AGENT

Product Description

BaraVis® W-967 viscosifier/suspension agent is a powdered biopolymer used to viscosify fresh water, seawater and monovalent brines. BaraVis W-967 viscosifier/suspension agent can provide excellent suspension and shear thinning properties at higher temperature ranges than typical xanthan gum products. Its upper temperature limit is around 310°F (154°C).

Applications/Functions

- Viscosify fresh water and brine-based fluids used in drilling, milling, under-reaming, and gravel packing operations
- Suspend bridging agents and weighting materials in fresh water and brine systems

Advantages

- Helps provide elevated low shear rate viscosity with minimal plastic viscosity
- Functions over a wide salinity range, with improved tolerance of cement
- Helps minimize the potential for formation damage
- Readily biodegradable / suitable for North Sea operational requirements

Typical Properties

- Appearance: Cream-colored powder
- Specific Gravity: 1.5

Recommended Treatment

Add 0.5-1.5 lb/bbl (1.4-4.3 kg/m³) of BaraVis W-967 viscosifier/suspension agent as needed to obtain the desired viscosity and suspension characteristics. Oxygen scavengers are recommended to extend the service life at elevated temperatures.

Packaging

BaraVis W-967 viscosifier/suspension agent is packaged in sacks containing 50-lb (22.7-kg) net weight.

BaraVis® IE-570

VISCOSIFIER

Product Description

BaraVis® IE-570 (formerly BDF™-570) viscosifier is an oil soluble organic product designed to provide increased low end rheology and fragile gels in organophilic clay-free high performance invert emulsion fluids. The product can be used alone or in conjunction with TAU-MOD® viscosifier or RHEMOD™ L viscosifier for even greater effect. BaraVis IE-570 viscosifier is suitable for use in offshore and environmentally sensitive areas.

Applications/Functions

- Helps increase low shear rheology and Tau 0 value
- Improves barite suspension in some systems
- Helps improve stability of low weight fluid systems

Advantages

- Is not a clay based material
- Increases low shear rheology without significant contribution to plastic viscosity (PV)
- Helps impart fragile gels to low mud weight organoclay-free fluids
- Stable to high alkalinity; Does not undergo hydrolysis
- Rated yellow for Norway

Typical Properties

Appearance:	Yellow liquid
Specific Gravity:	0.9
Flash point:	>392°F (200°C)
Solubility:	Oil soluble / oil dispersible

Recommended Treatment

Add 1-6 lb/bbl (2.9-17.2 kg/m^3) BaraVis IE-570 viscosifier to the active mud system.

Note: For fresh builds, BaraVis IE-570 viscosifier should be the last product to be added when mixing.

Packaging

BaraVis IE-570 viscosifier is available in 397 lb (180 kg) drums and bulk packaging.

BaraVis® IE-615

VISCOSIFIER

Product Description

BaraVis® IE-615 (formerly BDF™-615) viscosifier is a liquid polymer latex that is used to increase low end rheology and provide suspension in invert emulsion drilling fluids. It can be used in conventional and clay-free high performance fluids. BaraVis IE-615 viscosifier can be used at a wide range of temperatures.

Applications/Functions

- Helps increase viscosity and suspension properties of non-aqueous fluids
- Shown to be effective in a wide variety of base oil types
- It can be used in systems formulated with or without organophilic clays

Advantages

- Helps increase low end rheology at low concentrations
- Stable at temperatures greater than 450°F (232°C)
- Can be used with all non-aqueous fluids
- Liquid product is readily mixed into non-aqueous systems

Typical Properties

Appearance:	Milky white liquid (latex)
Specific Gravity:	1.0 – 1.2

Recommended Treatment

Add 0.5 - 4.0 lb/bbl (1.4-11.4 kg/m^3) of BaraVis IE-615 viscosifier as needed to obtain the desired viscosity and suspension characteristics.

Packaging

BaraVis IE-615 viscosifier is available in 5-gal cans and 50-gal drums.

BaraVis® W-617

VISCOSIFIER

Product Description

BaraVis® W-617 (formerly CFS™-617) viscosifier is a liquid bio-polymer that is used to viscosify divalent brines. BaraVis W-617 viscosifier is a liquid dispersion that allows rapid mixing and dispersion into brine-based fluids. BaraVis W-617 viscosifier can be used at temperatures up to 250°F (121°C). BaraVis W-617 viscosifier is designed to be used in conjunction with BaraFLC® W-616 filtration control agent.

Applications/Functions

- Viscosify calcium brine-based fluids used in drilling, completion, milling, underreaming, and gravel packing operations
- Suspends bridging agents and weighting materials in aqueous based fluid systems
- Increases low shear rheology to improve fluid cutting transport capacity and sweep efficiency
- Used in conjunction with BaraFLC W-616 filtration control agent for high density brine applications
- Component for BRINEDRIL-N® drill-in fluid systems

Advantages

- Helps viscosify calcium brine fluid systems
- Stable to 250°F (121°C) in calcium chloride and bromide based brines
- Can readily viscosify solids free systems up to 14.5 lb/gal density (1.73 SG)
- Liquid product is readily mixed into brine and other aqueous systems

Typical Properties

Appearance:	Clear liquid
Specific Gravity:	1.18
Solubility:	Water soluble

Recommended Treatment

Add 0.5-2.0 gal/bbl of BaraVis W-617 viscosifier, or as needed to obtain the desired viscosity and suspension characteristics.

Packaging

BaraVis W-617 viscosifier is packaged in 5-gal pails and 55-gal drums.

BARAZAN®

VISCOSIFIER/SUSPENSION AGENT

Product Description

BARAZAN® viscosifier/suspension agent is a powdered Xanthan gum polymer used to viscosify fresh water, seawater and monovalent brines. BARAZAN viscosifier/suspension agent can provide excellent suspension and shear thinning properties. It contains no dispersants or bacterial stabilizers. BARAZAN viscosifier/suspension agent can be used up to 250°F (121°C).

Applications/Functions

- Viscosify fresh water and brine-based fluids used in drilling, milling, under-reaming, and gravel packing operations
- Suspend bridging agents and weighting materials in fresh water and brine systems

Advantages

- Helps provide thixotropic properties and non-Newtonian flow characteristics at low concentrations over a wide salinity range
- Helps reduce friction
- Helps minimize the potential for formation damage

Typical Properties

- Appearance: White powder
- Specific Gravity: 1.5

Recommended Treatment

Add 1-2 lb/bbl (2.85-5.71 kg/m³) of BARAZAN viscosifier/suspension agent or as needed to obtain the desired viscosity and suspension characteristics.

Packaging

BARAZAN viscosifier/suspension agent is packaged in sacks containing 25-lb (11.3-kg) sacks and 55.1-lb (25-kg) sacks.

BARAZAN® L™

VISCOSIFIER

Product Description

BARAZAN® L™ viscosifier is a Xanthan gum polymer dispersed in a liquid carrier. It is used to viscosify fresh water, seawater and monovalent brines. BARAZAN L viscosifier disperses and mixes even more easily than BARAZAN® D™ viscosifier with little shear and it does not generate fish-eyes. It is the product of choice when rapid dispersion or minimal mixing is desired. BARAZAN L viscosifier can be used up to 250°F (121°C).

Applications/Functions

- Viscosify fresh water and brine-based fluids used in drilling, milling, underreaming, and gravel packing operations
- Suspend bridging agents and weighting materials in fresh water and brine systems

Advantages

- Helps disperse rapidly
- Helps provide thixotropic properties and non-Newtonian flow characteristics at low concentrations over a wide salinity range
- Helps provide excellent suspension without the need for clays
- Helps minimize the potential for formation damage

Typical Properties

- Appearance: Off-white suspension
- Specific Gravity: 1.1

Recommended Treatment

Add 0.5 -2 lb/bbl (1.43-5.71 kg/m³) of BARAZAN L viscosifier, or as needed to obtain the desired viscosity and suspension characteristics.

Packaging

BARAZAN L viscosifier is packaged in 5-gal (18.9-l) cans containing 40-lb (18-kg) net weight.

BARAZAN® D™

VISCOSIFIER/SUSPENSION AGENT

Product Description

BARAZAN® D™ viscosifier/suspension agent is a powdered Xanthan gum polymer used to viscosify fresh water, seawater and monovalent brines. BARAZAN D viscosifier/suspension agent is treated with a dispersant to help improve mixing and promote the yield of the product with reduced amounts of shear as compared to BARAZAN® viscosifier/suspension agent. BARAZAN D viscosifier/suspension agent can provide excellent suspension and sheer thinning properties and be used up to 250°F (121°C).

Applications/Functions

- Viscosify fresh water and brine-based fluids used for drilling, milling, under-reaming, and gravel packing operations
- Suspend bridging agents and weighting materials in fresh water and brine systems

Advantages

- Disperses easily in fresh water muds, and brines
- Helps provide thixotropic properties and non-Newtonian flow characteristics over a wide salinity range at low concentrations
- Helps provide excellent suspension without the need for clays
- Stable to 250°F (121°C)
- Helps minimizes the potential for formation damage

Typical Properties

- Appearance: Yellow to white powder
- pH, (1% aqueous solution): 6.3
- Specific Gravity: 1.6

Recommended Treatment

Mix 0.1-2 lb/bbl of BARAZAN D viscosifier/suspension agent (0.3-5.7 kg/m³), as needed to obtain the desired viscosity and suspension characteristics.

Packaging

BARAZAN D viscosifier/suspension agent is packaged in 25-lb (11.3-kg) sacks, 50-lb (22.7-kg) sacks, and 55.1-lb (25-kg) sacks.

BARAZAN® D PLUS™

VISCOSIFIER/SUSPENSION AGENT

Product Description

BARAZAN® D PLUS™ viscosifier/suspension agent is a is premium quality, powdered Xanthan gum polymer that is used to viscosify fresh water, seawater and monovalent brines. BARAZAN D PLUS viscosifier/suspension agent is treated with a dispersant to promote the yield with reduced amounts of shear for improved mixing properties. BARAZAN D PLUS viscosifier/suspension agent has higher yield specifications and develops more viscosity / suspension than equivalent concentrations of BARAZAN® or BARAZAN® D™ viscosifiers/suspension agents. BARAZAN D PLUS viscosifier/suspension agent can be used up to 250°F (121°C).

Applications/Functions

- Viscosify fresh water and brine-based fluids used for drilling, milling, under-reaming, and gravel packing operations
- Suspend bridging agents and weighting materials in fresh water and the brine systems described above

Advantages

- Disperses easily in fresh water or brine with shear
- Helps provide thixotropic properties and non-Newtonian flow characteristics over a wide salinity range at low concentrations
- Helps provide excellent suspension without the need for clays
- Helps minimize the potential for formation damage
- Stable to 250°F (121°C)

Typical Properties

Appearance:	Yellow to white powder
pH, (1% aqueous solution):	6.3
Specific Gravity:	1.6

Recommended Treatment

Add 0.1-2 lb/bbl (0.3-5.7 kg/m³) of BARAZAN D PLUS viscosifier/suspension agent, or as needed to obtain the desired viscosity and suspension characteristics.

Caution: Loss of viscosity and possible polymer precipitation can occur when used in a high pH and high calcium ion environment

Packaging

BARAZAN D PLUS viscosifier/suspension agent is packaged in 25-lb (11.3-kg) sacks and 55.1-lb (25-kg) sacks.

BaraZyme™ W-1012

STARCH BREAKER

Product Description

BaraZyme™ W-1012 starch breaker is an alpha-amylase enzyme used to degrade the starch component of water-based drill-in fluids.

Applications/Functions

- Removal of starch in low temperature <176°F (80°C) reservoirs.

Advantages

- Effective at very low concentrations
- Degrades starch to soluble oligomers
- Compatible with N-FLOW™ filter cake breaker systems
- Minimal tendency to coagulate
- More stable at low pH (4) than other commercial enzymes

Typical Properties

Appearance:	Amber liquid
pH:	4.5 – 6.5

Recommended Treatment

0.1 - 0.25% v/v in breaker formulation.

Packaging

BaraZyme W-1012 is available in 30kg pails.

BaraZyme W-1049

ENZYME BREAKER

Product Description

BaraZyme W-1049 enzyme breaker is a powdered alpha-amylase utilized to degrade the starch component of water-based drill-in fluids.

Applications/Functions

- Removal of starch in low temperature <176°F (80°C) reservoirs.

Advantages

- Effective at very low concentrations
- Degrades starch to soluble oligomers
- Compatible with N-FLOW™ filter cake breaker systems and monovalent brines

Typical Properties

- Appearance: Beige to light brown powder
- Solubility: Soluble in water

Recommended Treatment

BaraZyme W-1049 should be used at concentrations of 0.1 – 2.0 lb/bbl (0.29 – 5.71 kg/m^3), with the dosage verified by laboratory testing ahead of field application. Suitable for monovalent brines only.

Packaging

BaraZyme W-1049 enzyme breaker is available in 20-kg (44-lb) bags.

Barite Portfolio

WEIGHTING AGENTS

Description

Baroid offers several grades of barite materials to serve a wide range of global applications. Standard API-grade material is commonly used to add density in drilling fluids for onshore wells and less challenging offshore wells. For more challenging drilling environments like deepwater, extended reach and High Pressure/High Temperature wells, specialized grades of barite can provide significant benefits. These include enhanced sag resistance and greater conveyance through fine mesh shaker screens or even production screens.

Baroid 325 Mesh was the first specialized grind barite introduced to the US Gulf of Mexico (GOM) market in 2011. Its refined particle size distribution was first used in BaraECD® fluid systems allowing reduced rheological properties and associated Equivalent Circulating Density (ECD), while still retaining adequate weight material suspension even in highly deviated wellbore trajectories.

Additional wellbore challenges across major international basins led to the introduction of Ultra-Fine Grade and Micronized barite in other areas. These extended the range of BaraECD® applications to provide greater performance in very narrow pressure margin drilling and subsequent completions using a range of production screen sizes.

Advantages

- Proactive quality control and manufacturing processes to ensure product specifications are met
- Range of particle sizes available for customized fluid designs
- Specialized grades allow for greater sag resistance in deepwater and extended reach wells
- Increased solids control efficiency

Typical Properties

- Appearance: Light tan to gray particles
- Specific gravity: 4.1 or greater

Material Range

Material	SAP MN	Description	D 50, µm	D 90, µm	Density, SG
BAROID 41 - TON (ST)	478098	4.1 Barite	16-25	45-65	4.1
BARITE – TON	213235	API Barite	16-25	45-65	4.2
BAROID 325 MESH - ST	959712	Barite 325	10-16	30-45	4.2
BARITE ULTRA FINE - METRIC TON	469414	Ultra-Fine Grade (UFG)	5-10	10-30	4.2
MICRONIZED BARITE - METRIC TON	1072771	Micronized Barite*	< 5	< 10	4.2

*GOM Region material is BaraECD® 4.3 Weighting Agent - ST (MN# 1184676)

BAROID® 41

WEIGHTING MATERIAL

Product Description

BAROID® 41 weighting material is ground Barite and used to increase the density of drilling fluids to control formation pressures. BAROID 41 weighting material has a specific gravity of 4.1 and can be used to increase the density in oil and water-based drilling fluids up to 20 lb/gal (2.40 SG). BAROID 41 weighting material is more widely available than standard BAROID weighting material. It is chemically inert and does not affect drilling fluid chemical properties.

Applications/Functions

- Helps increase mud density up to 20 lb/gal (2516 kg/m^3)
- Helps control formation pressures
- Helps stabilize the borehole
- Helps prepare solids-laden plugs for well control applications

Advantages

- The industry standard weighting agent for drilling fluids
- Chemically inert
- Cost-effective weighting agent

Typical Properties

- Appearance: Powder
- Specific Gravity, minimum: 0.749 to 0.77

Recommended Treatment

Use the following weight-up formulas to determine the appropriate concentrations to be added to the system.

For 1 bbl starting volume: $X = 1435 (W_f - W_i)/(34.2 - W_f)$
For 1 bbl final volume: $X = 1435 (W_f - W_i)/(34.2 - W_f)$

Where:
X = BAROID 41 weight material required, lb/bbl
W_i = Initial mud weight, lb/gal
W_f = Final desired mud weight, lb/gal.

Packaging

BAROID 41 weighting material is packaged in 50-lb (27.7-kg), 100-lb (45.4-kg) and 88.2-lb (40-kg) sacks and in bulk.

BDF™-522

SHALE STABILIZER

Product Description

BDF™-522 inhibitor provides a reduction in the water activity of BaraPure® Salt-Free, High-Performance Non-Aqueous drilling fluids. This organic liquid product acts as a salt replacement and creates a hygroscopic internal phase.

Applications/Functions

- Provides lowered water activity to drive the wellbore-stabilizing osmotic dehydration effect
- Eliminates the need for chloride-containing salts which can limit waste disposal options

Advantages

- Easily blended into the BaraPure fluid system
- Can be used to modify inhibitive character as hole conditions dictate
- Reduces Health, Safety and Environmental concerns with salts in sensitive areas
- Biodegradable and non-toxic

Typical Properties

Appearance:	Amber liquid
Specific Gravity:	1.2 – 1.3
Solubility:	Miscible in water

Recommended Treatment

Add BDF-522 as needed to maintain the desired level of water activity in BaraPure fluid systems.

Packaging

BDF-522 is available in 55-gal (208-l) drums and in bulk.

BDF™-610

FILTRATION CONTROL ADDITIVE

Product Description

BDF™-610 filtration control additive reduces the HTHP filtrate of invert emulsion drilling fluids. This liquid product was formulated for environmentally-sensitive North Sea offshore applications and can be used with all standard invert emulsion systems at moderate working temperatures.

Applications/Functions

- Provides low, all-oil HPHT filtrate values
- Assists in forming a competent filter cake

Advantages

- Meets North Sea Environmental requirements
- Can easily be added to invert emulsion drilling fluids
- Has minimal effect on the fluid rheology
- Reduces dust from the use of powdery additives

Typical Properties

Appearance:	Amber liquid
Specific Gravity:	0.98 – 1.02
Flash Point:	>212°F (100°C)

Recommended Treatment

Add 2-6 lb/bbl (5.7-17.1 kg/m^3) of BDF-610 as needed to lower HPHT filtrate.

Packaging

BDF-610 is packaged in 5-gal (18.9-l) cans, 55-gal (208-l) drums and in bulk.

BDF™-662

SHALE STABILIZER

Product Description

BDF™-662 shale stabilizer is treated natural asphalt, engineered to be highly dispersible and compatible with all drilling fluids. It is used in stabilizing shale sections, controlling HPHT fluid loss, minimizing spurt loss and sealing micro-fractured shale. It is comparable to gilsonite-based products and other black powders, with a softening point above 400°F (204°C). An increase in viscosity at low temperatures can be observed. It is stable to many normal drilling fluid contaminants and operates at a broad pH range. BDF-662 shale stabilizer helps to form a thin yet tough wall cake, whereby the small particles can effectively plug micro-fractures and shale pores..

Applications/Functions

- Free-flowing black powder; added directly to any fluid system
- Readily disperses in water-based and oil-based fluids
- Reduces high temperature fluid loss

Advantages

- Improves wellbore stability in water-based fluids at high temperatures
- Thermal stability beyond 400°F (204°C)

Typical Properties

Appearance:	Black powder; granular
Solubility:	Water Dispersible; Oil Dispersible
Specific Gravity:	1.2 – 1.5
Softening Point:	>400°F (>204°C)
Moisture Content:	<10%

Recommended Treatment

For optimum results, an initial treatment of 2 to 8-lb/bbl with daily treatments of up to 0.5-lb/bbl is recommended. Pilot testing is always recommended to determine proper treatment to achieve desired fluid properties.

Packaging

BDF-662 is packed in 50-lb (22.7-kg) sacks.

BDF™-677

SHALE STABILIZER

Product Description

BDF™-677 shale stabilizer is a cationic organic monovalent clay inhibitor for polymer-based drilling, workover and completion fluids. BDF-677 is completely water soluble and environmentally acceptable and may be used in freshwater, seawater, low-solids or weighted systems.

Applications/Functions

- Effective clay inhibitor for water sensitive formations
- Limits cuttings dispersion
- Minimizes accretion potential

Advantages

- Prevents clay swelling caused by water molecule invasion
- No adverse effects on viscosity or filtration control
- Non-foaming, non-oil wetting

Typical Properties

Appearance:	White powder
Purity:	> 99%
Specific Gravity:	1.3
Bulk Density at 20°C:	96-lb/ft^3
Moisture Content:	< 0.5%
pH 5% Solution:	4 – 6.5 (approx.)

Recommended Treatment

BDF-677 is designed to be used at a pH range of 10.5, or less. For optimum results, an initial treatment of 3-7 lb/bbl (8.5-20 kg/m^3) is recommended. Pilot testing is always recommended to determine proper treatment to achieve desired fluid properties.

Packaging

BDF-677 is packaged in 25-kg sacks; store in dry, well-ventilated areas.

BaraMul™ IE-685

EMULSIFIER

Product Description

BaraMul™ IE-685 (formerly BDF™-685) secondary emulsifier provides fast emulsification and oil-wetting in non-aqueous systems. This proprietary surfactant can be used alone or with a primary emulsifier product to produce highly stable oil- or synthetic-based drilling fluids. BaraMul IE-685 does not require additions of lime like other primary emulsifier products.

Applications/Functions

- Provides stable invert emulsions
- Acts to oil-wet solids in the system
- Stabilizes the fluid to high temperatures and contaminants
- Contributes to stable rheological properties

Advantages

- Easily blended into ENVIROMUL™ or other non-aqueous fluid systems
- Can be used with oil or synthetic based fluids
- Compatible with all non-aromatic base oil systems
- Fast-acting emulsification

Typical Properties

Appearance:	Amber liquid
Solubility:	Miscible in oil
Specific Gravity:	0.91
Flash point:	158°F (70°C)

Recommended Treatment

Add 2-14 lb/bbl (5.7-39.9 kg/m^3) of BaraMul IE-685 as needed to maintain the non-aqueous fluid system.

Packaging

BaraMul IE-685 is available in 55-gallon drums and in bulk.

BDF™-689

VISCOSIFIER

Product Description

BDF™-689 viscosifier is a proprietary liquid blend that is used to increase low shear rheology and gel strengths in BaraECD® fluid systems. It combines with the BaraECD Suspension Package to provide enhanced emulsion stability, particle suspension and hole cleaning capabilities. BDF-689 viscosifier can be used at operating temperatures up to 356°F (180°C).

Applications/Functions

- Helps increase viscosity and suspension properties of BaraECD non-aqueous fluids
- Provides stable, consistent rheology profiles for challenging low-ECD drilling projects

Advantages

- Helps increase low shear rheology at low concentrations
- Helps increase fragile gel strengths for improved weight material suspension
- Non-hazardous composition meets environmental regulations for most global drilling areas

Typical Properties

- Form: Amber liquid
- Specific Gravity: 1.05-1.07

Recommended Treatment

Add 0.35 to 4.0 lb/bbl (1.0-11.4 kg/m^3) for viscosity. Additional testing is recommended when BDF-689 will be combined with other system viscosifiers.

Packaging

BDF-689 viscosifier is packaged in 55-gal (208.2-L) drums and bulk.

BaraMul™ IE-694

EMULSIFIER

Product Description

BaraMul™ IE-694 (formerly BDF™-694) emulsifier provides primary emulsification of the aqueous phase in an invert emulsion. This surfactant also helps to lower the filtrate of oil- or synthetic-based drilling fluids. For best results, BaraMul IE-694 should be used with lime in the fluid system.

Applications/Functions

- Provides stable invert emulsions
- Reduces the HPHT filtrate, and helps eliminate free water or brine from the filtrate
- Aids in secondary wetting of solids in the system
- Stabilizes the fluid to high temperatures and contaminants

Advantages

- Easily blended into ENVIROMUL™ fluid or other invert emulsion fluid systems
- Suitable for use with oil and synthetic base fluids
- Compatible with all non-aromatic base oil systems
- Fast-acting emulsification

Typical Properties

Appearance:	Black liquid
Solubility:	Insoluble in water
Specific Gravity:	0.89
Flash point:	156°F (69°C)

Recommended Treatment

Add 2-10 lb/bbl (5.7-28.5 kg/m^3) of BaraMul IE-694 as needed to maintain the invert emulsion fluid system. Use 0.5-1.0 lb/bbl of lime for each pound of BaraMul IE-694 added.

Packaging

BaraMul IE-694 is available in 55-gallon drums and in bulk.

BDF™-905

WETTING AGENT

Product Description

BDF™-905 wetting agent is a proprietary liquid blend that enhances the dispersion and oil wetting of micronized weighting agents in the BaraECD® fluid system. It assists in achieving improved resistance to static or dynamic sag. Based on laboratory testing, BDF-905 wetting agent can be used at operating temperatures up to 356°F (180°C).

Applications/Functions

- Helps increase suspension properties of non-aqueous fluids
- Aids in wetting micronized materials with minimal effects on the fluid properties

Advantages

- Helps prevent agglomeration of small weighting agent particles
- Non-hazardous composition meets environmental regulations for most global drilling areas
- Improves suspension properties of BaraECD at temperatures greater than 145°C (293°F)
- Enhances wetting of non-barite weighting agents like manganese tetroxide

Typical Properties

- Form: Clear liquid
- Specific Gravity: 1.1-1.2
- Flash point: > 149°C (> 300.2°F) PMCC

Recommended Treatment

Add 2 to 12 lb/bbl (5.7-34.2 kg/m^3) for wetting to enhance the formulation. Long-term stability testing is recommended to optimize performance.

Packaging

BDF-905 wetting agent is packaged in 55-gal (208.2-L) drums and bulk.

BDF™-917

EMULSIFIER

Product Description

BDF™-917 emulsifier is a complex amine compound used to promote emulsification of brine and oil wetting of solids in non-aqueous fluid (NAF) systems. Unlike similar liquid emulsifier products, it does not contain a Diesel or mineral oil diluent. It does not require additions of hydrated lime for activation. BDF-917 emulsifier may be used to build new volumes of NAF systems, or to treat existing systems. Because of its low pour point, BDF-917 emulsifier is well suited for use in colder climates.

Applications/Functions

BDF-917 emulsifier can be used to emulsify brine and oil-wet solids in NADF

Advantages

- Promotes stable emulsion character
- Helps improve drill solids tolerance
- Highly active composition with sub-zero pour point

Typical Properties

Appearance:	Dark amber liquid
Specific Gravity:	0.91 to 0.94
Flash point:	158°F (70°C)

Recommended Treatment

To build new volumes of NADF, add 6-12 lb/bbl (17.1 – 34.2 kg/m^3) of BDF-917 emulsifier. For treatment of existing systems, add 0.5 – 5.0 lb/bbl (0.2 – 14.3 kg/m^3).

Packaging

BDF-917 emulsifier is packaged in 55-gallon / 400-lb net (208 L / 181-kg net) drums.

BDF™-918

EMULSIFIER

Product Description

BDF™-918 emulsifier is a blend of modified fatty acids and complex amines used to promote emulsification of brine and oil wetting of solids in non-aqueous fluid (NAF) systems. Unlike similar liquid emulsifier products, it does not contain a diesel or mineral oil diluent. Hydrated lime should be added to the active fluid system to assist in activation of the product. BDF-918 emulsifier may be used to build new volumes of NAF systems, or to treat existing systems. Because of its low pour point, BDF-918 emulsifier is particularly well suited to cooler climates.

Applications/Functions

BDF-918 emulsifier can be used to tightly emulsify brine in NADF systems

Advantages

- Promotes stable emulsion character
- Helps improve drill solids tolerance
- Highly active composition with sub-zero pour point

Typical Properties

Appearance:	Dark amber liquid
Specific Gravity:	0.88 to 0.90
Flash point:	158°F (70°C)

Recommended Treatment

To build new volumes of NADF, add 6-12 lb/bbl (17.1 – 34.2 kg/m^3) of BDF-918 emulsifier. For treatment of existing systems, add 0.5 – 5.0 lb/bbl (0.2 – 14.3 kg/m^3). Add 1 lb/bbl (0.4 kg/m^3) of hydrated lime to the active drilling fluid system for every 2 lb/bbl (0.8 kg/m^3) of BDF-918 emulsifier added to the system.

Packaging

BDF-918 emulsifier is packaged in 55-gallon, 395-lb net (208 L / 179-kg net) drums.

BDF™-925

EMULSIFIER

Product Description

BDF™-925 emulsifier provides emulsification and oil-wetting in invert emulsion systems. This highly-active surfactant can be used alone or with primary emulsifier products to produce highly stable oil- or synthetic-based drilling fluids. BDF-925 does not require additions of lime like some emulsifier products.

Applications/Functions

- Provides stable invert emulsions
- Contributes to stable rheological properties
- Acts to oil-wet solids in the system

Advantages

- Easily blended into invert emulsion fluid systems
- Fast-acting to achieve emulsification

Typical Properties

Appearance:	Amber liquid
Flash point:	185°F (85°C)
Solubility:	Miscible in oil

Recommended Treatment

Add 2-14 lb/bbl (5.7-39.9 kg/m^3) of BDF-925 as needed to maintain the invert emulsion fluid system.

Packaging

BDF-925 is available in bulk and 55-gallon drums.

BORE-PLUS™

SUSPENSION AGENT

Product Description

BORE-PLUS™ suspension agent is a polymer blend for imparting viscosity, suspension and improved fluid loss control to BOREMAX® drilling fluids and other water based fluid systems. BORE-PLUS suspension agent is suitable for use in freshwater and seawater fluids up to 350°F (177°C). When using BORE-PLUS suspension agent, total calcium should be kept below 600ppm.

Applications/Functions

- Can be used to reduce fluid loss in fresh, brackish, or salt water.
- Can function secondarily as a shale inhibitor

Advantages

- Helps stabilize the mud system to temperatures approaching 350°F (177°C)
- Not susceptible to bacterial degradation
- Can tolerate calcium contamination up to 600 ppm
- Helps stabilize fluid rheology

Typical Properties

Appearance:	White flakes and powder
pH:	6 to 9
Bulk Density:	28 lb/ft³ (449kg/m³)

Recommended Treatment

1. For fresh water fluids, add 0.25-2.0 lb/bbl (0.7-2.9 kg/m³)
2. For salt water fluid, add 1.0-3.0 lb/bbl (2.9-8.6 kg/m³)

Packaging

BORE-PLUS suspension agent is packaged in 50-lb (22.7-kg) sacks.

BrineDril Vis

VISCOSIFIER

Product Description

BrineDril Vis viscosifier is a water-soluble biopolymer that exhibits exceptional shear thinning rheology and suspension properties in brine. BrineDril Vis viscosifier increases low shear rheology with minimal impact on plastic viscosity. It is more tolerant to multivalent ions, has higher temperature stability than xanthan gum and is stable up to a pH of 12. This product is an excellent choice for reservoir drilling fluid applications. BrineDril Vis viscosifier is suitable for use up to 300°F (149°C).

Applications/Functions

- Reservoir drilling fluids
- Monovalent and divalent brine-based fluids

Advantages

- More tolerant to multivalent ions than xanthan gum
- Increases low shear rheology with minimal impact on plastic viscosity
- Higher temperature stability than xanthan gum

Typical Properties

- Appearance: Pale yellow powder
- Water solubility: 40 g/L at 20°C

Recommended Treatment

Add 0.5 – 5.0 lb/bbl (1.43 – 14.3 kg/m^3) of BrineDril Vis viscosifier through the hopper to obtain the desired viscosity and suspension characteristics.

Packaging

BrineDril Vis viscosifier is packaged in 55-lb (25-kg) sacks.

BXR-L™

SHALE STABILIZER

Product Description

BXR-L™ shale stabilizer is a shale stabilizer, lubricity modifier, and fluid loss additive for use in most water-based drilling fluids. It is made from blended natural hydrocarbons. BXR-L shale stabilizer is a liquid product that rapidly disperses in water based fluids. The product mixture helps seal water sensitive shales as well as bridging micro-fractures and permeable zones. BXR-L shale stabilizer is thermally stable above 400°F (204°C).

Applications/Functions

- Helps bridge microfractures and permeable zones
- Helps reduce the potential for differential sticking and torque/drag occurrences
- Helps stabilize wellbores

Advantages

- Applicable in all water-based drilling fluids
- Stable at temperatures above 400°F (204°C)
- Helps improve dynamic and static fluid loss properties
- Environmentally responsible

Typical Properties

Appearance:	Black liquid
Specific Gravity:	1.13

Recommended Treatment

Add 8-40 lb/bbl (22.82-114.12 kg/m³) of BXR-L shale stabilizer to the system

Packaging

BXR-L shale stabilizer is packaged in 55-gal (208-l) drums and in bulk volume.

CARBONOX®

FILTRATION CONTROL ADDITIVE

Product Description

CARBONOX® filtration control additive is a natural occurring product that also displays dispersive / thinning characteristics in water-based drilling fluid systems. CARBONOX filtration control additive requires an alkaline environment to solubilize and function therefore should be used at pH 9.0 or above. CARBONOX filtration control additive functions well in high pH environments and is tolerant of common mud contaminants such as calcium up to 1000 ppm, making it suitable for use in lime & gypsum mud systems. CARBONOX filtration control additive can provide effective filtration control in fresh to saturated salt water systems in temperatures exceeding 400°F (204°C). CARBONOX filtration control additive is principally used to maintain combined filtration control and thinning efficiency in dispersed, high solids content drilling fluid systems. CARBONOX filtration control additive can also be used to emulsify low volumes of oil into water-based fluids systems.

Applications/Functions

- Helps reduce the viscosity and gel strengths of drilling fluids to maintain desirable flow properties
- Helps reduce high-temperature/high-pressure filtration rates
- Helps minimize the effects of contaminants on drilling fluid properties
- Helps emulsify oil into water

Advantages

- Helps maintain continued thinning efficiency and filtration control even at high bottomhole temperatures
- Is thermally stable at temperatures above 400°F (204°C)
- Helps retard solidification at high pH levels
- Is versatile and economical
- Helps form a thin, tough filter cake

Typical Properties

- Appearance: Black powder
- Specific Gravity: 1.7

Recommended Treatment

Add 2-12 lb/bbl (5.7-34.2 kg/m³) of CARBONOX filtration control additive

Note: Pre-solubilize CARBONOX filtration control additive with caustic soda (5:1) for best results.

Packaging

CARBONOX filtration control additive is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks.

CFS™-992

NON-EMULSIFIER

Product Description

CFS-992 is a non-emulsifier designed to prevent brine/oil emulsions which can occur during well completion operations. CFS-992 non-emulsifier is designed for use in a wide range of brine types. CFS-992 non-emulsifier helps enhance completion fluid recovery from invaded formations by preventing the creation of emulsions with reservoir hydrocarbon.

Applications/Functions

- Dispersible in a wide range of brine types, both monovalent and divalent
- Lowers the surface tension of brines

Advantages

- Prevents emulsion block formation damage
- Effective at very low concentrations
- Helps maximize completion fluid recovery

Typical Properties

Appearance:	Colorless to pale yellow liquid
Specific gravity:	0.99 – 1.01
pH (1% wt solution at 25°C):	7.1 – 7.5

Recommended Treatment

Add 0.5 – 1.0 lb/bbl CFS-992 non-emulsifier to completion brines or drill-in fluids. Laboratory testing is required to optimize the treatment, preferably with produced crude samples.

Packaging

CFS-992 non-emulsifier is packaged in 200 kg drums.

CLAY GRABBER®

SHALE STABILIZER

Product Description

CLAY GRABBER® shale stabilizer is a liquid emulsion synthetic polymeric flocculent and clay encapsulator. CLAY GRABBER unique polymer structure reduces shale dispersion and helps stabilize water sensitive shales. CLAY GRABBER shale stabilizer is well suited for use in polymer based fluids at pH below 10 and works well in fresh water, sea water, and monovalent brines. CLAY GRABBER shale stabilizer is stable up to 300°F (149°C).

Applications/Functions

- Primary component in the HYDRO-GUARD® system
- Stable to 300 °F (149 °C)
- Potent total flocculant when small amounts of calcium (>80 and <600 ppm) are present
- Helps inhibit shale hydration and stabilize troublesome shales
- Encapsulates shale and blocks water-absorption when used with CLAY SYNC™ II™ shale stabilizer in salt water systems

Advantages

- Can be used in fresh water or monovalent brines
- Easily mixed with rapid yield
- Aids flocculating thereby lowering MBT and colloidal content
- Helps lubricate filter cake and improve cuttings integrity

Typical Properties

Appearance:	Opaque liquid
Specific Gravity:	1.02 – 1.06
pH, (1% aqueous solution):	6.5 to 7.5
Concentration, (% active polymer):	35 to 40

Recommended Treatment

For best results CLAY GRABBER shale stabilizer should be mixed through a high shear hopper

- 0.5–1.0 lb/bbl (1.4-2.9 kg/m³) in the HYDRO-GUARD system.
- 0.25-0.5 lb/bbl (0.7-1.4 kg/m³) as a selective flocculant for clear water drilling.
- 0.5-1.0 lb/bbl (1.4-2.9 kg/m³) for troublesome shales in a water-based system.

Floors and decks in mixing area can become slippery. Use 10% sodium hypochlorite for clean up.

Packaging

CLAY GRABBER shale stabilizer is packaged in 5-gal (18.9-l) pails containing 42-lb (19.1-kg) net weight and in 275-gal (1041-l) tote tanks containing 2300-lb (1043-kg) net weight.

CLAYSEAL® PLUS™

SHALE STABILIZER

Product Description

CLAYSEAL® PLUS™ shale stabilizer is used to inhibit hydration of reactive clays and shale formations. It is effective in most water based drilling fluids from fresh water to high salinity brines and is suitable for use up to 400°F (204°C). CLAYSEAL PLUS shale stabilizer functions best at a pH range from 7 to 10, but is also effective in lime based fluids. CLAYSEAL PLUS shale stabilizer helps reduce the potential for bit balling and improves drill solids removal. When used with CLAYSEAL PLUS shale stabilizer, clay based viscosifiers should be prehydrated before addition to the active fluid system.

Applications/Functions

CLAYSEAL PLUS shale stabilizer can be used to inhibit clay and shale hydration

Advantages

- Helps reduce the potential for bit balling
- Helps improve drill solids removal
- Effective in fresh water, sea water, salt water, lime, and low solids systems
- Is completely water soluble

Typical Properties

Appearance:	Transparent yellow liquid
Flash Point:	200°F (93°C)
pH:	6 to 8
Specific Gravity:	1.04

Recommended Treatment

Add 4-7 lb/bbl (11.4-20 kg/m³) of CLAYSEAL PLUS shale stabilizer.

- For best results, a minimum of 4 lb/bbl (11.4 kg/m³) of CLAYSEAL PLUS shale stabilizer is required
- Prehydrate all AQUAGEL® additions for viscosity and fluid loss before adding to system
- Initial treatments in non-dispersed systems may cause slight flocculation and may require a thinner.

Packaging

CLAYSEAL PLUS shale stabilizer is packaged in 5-gal (18.9-l) pails containing 41-lb (18.6-kg) net weight and in 55-gal (208-l) drums containing 459-lb (208-kg) net weight.

CLAY-SYNC™ II

SHALE STABILIZER

Product Description

CLAY-SYNC™ II shale stabilizer is a non-ionic, 100% active, dry polymer used as a clay inhibitor in water-based drilling fluids. It adheres to the surface of reactive clays which helps reduce dispersion and hydration while improving cuttings integrity. CLAY SYNC II shale stabilizer is compatible with fresh water, Sea Water and monovalent brines, is suitable for use up to 325°F (163°C) and does not impact drilling fluid properties when used as recommended.

Applications/Functions

- Primary component in the HYDRO-GUARD® system
- Stable to 325°F (163°C)
- Inhibitive qualities are enhanced by higher salt concentrations
- Helps maintain borehole stability and promote gauge holes in shales and siltstone
- Low molecular weight allows pore-space water-blocking in shales
- Helps inhibit hydratable formation / promotes higher solids removal

Advantages

- Can be used in all monovalent brines
- Easily mixed and dispersible
- Does not blind shakers
- Does not impact drilling fluid properties when used in recommended concentrations
- Helps promote improved cuttings integrity

Typical Properties

Appearance:	Off white powder
pH, (0.5% aqueous solution):	6.5 to 7.5
Specific Gravity:	1.04
Concentration, (% active polymer):	100

Recommended Treatment

CLAY-SYNC II shale stabilizer should be mixed through the hopper for best results in the HYDRO-GUARD system. If salinity >140,000 ppm use 2 lb/bbl (5.6 kg/m³), if salinity <140,000 ppm use 3 lb/bbl (8.4 kg/m³) or more.

Packaging

CLAY-SYNC II shale stabilizer is packaged in 50-lb (22.7-kg) bags

CLAY-SYNC™ III

SHALE STABILIZER

Product Description

CLAY-SYNC™ III shale stabilizer is a non-ionic dry polymer used as a clay inhibitor in water- based drilling fluids. It adheres the surface of reactive clays which helps to reduce clay dispersion and hydration while improving cuttings integrity. CLAY-SYNC III shale stabilizer is compatible with fresh water, seawater and monovalent brines, is suitable for use up to 325°F (163°C) and has minimal impact on drilling fluid flow properties when used as recommended.

Applications/Functions

- One of the primary components in BaraHib® high performance water based system
- Enhanced inhibitive qualities when used in conjunction with higher salt concentrations
- Helps maintain borehole stability, minimize clay erosion and promote gauge holes in shales and siltstone
- Low molecular weight allows pore-space water-blocking in shales
- Helps inhibit water uptake by cuttings / promotes higher solids removal

Advantages

- Can be used in all monovalent brines
- Easily mixed and dispersible; functions at the same treatment level as CLAY-SYNC™ II, or slightly lower
- Does not blind shakers
- Has minimal impact on drilling fluid properties when used in recommended concentrations
- Helps promote improved cuttings integrity

Typical Properties

Appearance:	Off white powder
pH, (0.5% aqueous solution):	6.0 to 8.0
Bulk density:	0.5-0.8

Recommended Treatment

CLAY-SYNC III shale stabilizer should be mixed through the hopper for best results.

- 0.75 – 2.75 lb/bbl (2.14 – 7.85 kg/m^3)

Packaging

CLAY-SYNC III shale stabilizer is packaged in 50-lb (22.67-kg) and 55 lb (25 kg) bags

CMO-568™

LUBRICANT

Product Description

CMO-568™ lubricant can be used to enhance lubricity in invert emulsion fluids. CMO-568 lubricant performs best in Diesel based fluids, but has been used effectively in all other oil and synthetic based fluids. CMO-568 lubricant helps reduce torque and drag while reducing the potential for differential sticking. In conjunction with BaraCarb® sized bridging agent, CMO-568 lubricant can effectively bridge across porous sands, thus minimizing filtrate and whole mud invasion, filter cake build-up, seepage losses and reservoir damage.

Applications/Functions

- Help reduce torque and drag
- Help reduce incidence of differentially-stuck pipe

Advantages

- Can impart excellent lubricity
- Helps minimize differential sticking
- Water soluble

Typical Properties

Appearance	Yellow liquid
Flash point, PMCC >	320°F
Flash point, PMCC >	160°C
Specific gravity	1.23

Recommended Treatment

Used as a lubricant, the recommended concentration is 3.5-4.5 lb/bbl (9.98-12.83 kg/m³).

CMO-568 lubricant at 1-2 lb/bbl (2.85-5.7 kg/m³) is recommended to prevent stuck pipe (by increasing the filter cake lubricity). CMO-568 lubricant should be used in conjunction with 8-12 lb/bbl (22.8-34.2 kg/m³) appropriately sized BaraCarb bridging agent (ground marble) to help optimize filter cake quality.

Packaging

CMO-568 lubricant is packaged in 55-gal (208-l) drums.

DEXTRID® E™

FILTRATION CONTROL ADDITIVE

Product Description

DEXTRID® E™ filtration control additive is a modified starch product used to reduce mud filtrate in most water-based fluid systems, especially polymer non-dispersed. DEXTRID E filtration control additive contains no starch preservative. DEXTRID E filtration control additive is functional in freshwater thru saturated salt environments and does not increase fluid viscosity. DEXTRID E filtration control additive is temperature stable to approximately 250°F (121°C). DEXTRID E filtration control additive can also be used to encapsulate drill cuttings and exposed wellbore formations to reduce particle dispersion & reactive clay/shale formation swelling. Fluid pH must be maintained at 8.0 or above (preferably 8.5-9.0) to prevent bacterial degradation of the starch. DEXTRID E filtration control additive is used in areas where environmental limitations prevent the use of the bacterially stabilized variants of DEXTRID filtration control additive. DEXTRID E filtration control additive is non-damaging and can be used in both Drilling Fluid and reservoir Drill-in Fluid applications.

Applications/Functions

- Helps lower filtration rates in most water-based drilling fluid systems
- Helps improve borehole stability
- Helps flocculate dispersed drill cuttings in clear water drilling

Advantages

- Helps maintain filtration control without detrimental viscosity increase
- Effective with fast drilling non-dispersed systems
- Helps decrease clay dispersion

Typical Properties

Appearance:	Off-white powder
Specific Gravity:	1.5

Recommended Treatment

To help reduce filtration in drilling fluids, add 2-6 lb/bbl (5.7-17.1 kg/m^3) of DEXTRID E filtration control additive slowly through the hopper.

Note: Small amounts of PAC™ filtration control additive will complement DEXTRID E filtration control additive in fresh and salty drilling fluids.

Packaging

DEXTRID E filtration control additive is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks.

DEXTRID® LT™

FILTRATION CONTROL ADDITIVE

Product Description

DEXTRID® LT™ filtration control additive is a modified and bacterially stabilized starch product used to reduce mud filtrate in most water-based mud systems, especially polymer non-dispersed. DEXTRID LT filtration control additive is functional in freshwater through saturated salt environments and does not increase fluid viscosity. DEXTRID LT filtration control additive is temperature stable to approximately 250°F (121°C). DEXTRID LT filtration control additive can also be used to encapsulate drill cuttings & exposed wellbore formations to reduce particle dispersion & reactive clay/shale formation swelling. DEXTRID LT filtration control additive is non-damaging and can be used in both Drilling Fluid and reservoir Drill-in Fluid applications. DEXTRID LT filtration control additive is a preferred stabilized variant in North America environments.

Applications/Functions

- Helps lower filtration rates in most water-based drilling fluid systems
- Helps improve borehole stability
- Helps flocculate dispersed drill cuttings in clear water drilling

Advantages

- Helps maintain filtration control without detrimental viscosity increase
- Effective with fast drilling non-dispersed systems
- Helps decrease clay dispersion
- Readily biodegradable

Typical Properties

Appearance:	Fine or granulated powder
Specific Gravity:	1.5

Recommended Treatment

To help reduce filtration in drilling fluids, add 2-6 lb/bbl (5.7-17.1 kg/m³) of DEXTRID LT slowly through the hopper

Note: Small amounts of PAC™ filtration control additive will complement DEXTRID LT in fresh and salt water drilling fluids.

Packaging

DEXTRID LT filtration control additive is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks.

DEXTRID® LTE™

FILTRATION CONTROL ADDITIVE

Product Description

DEXTRID® LTE™ filtration control additive is a modified and bacterially stabilized starch product used to reduce mud filtrate in most water-based mud systems, especially polymer non-dispersed. DEXTRID LTE filtration control additive is functional in freshwater thru saturated salt environments and does not increase fluid viscosity. DEXTRID LTE filtration control additive is temperature stable to approximately 250°F (121°C). DEXTRID LTE filtration control additive is also used to encapsulate drill cuttings and exposed wellbore formations to reduce particle dispersion and reactive clay/shale formation swelling. DEXTRID LTE filtration control additive is non-damaging and can be used in both Drilling Fluid and reservoir Drill-in Fluid applications. DEXTRID LTE filtration control additive is a preferred stabilized variant in European environments.

Applications/Functions

- Helps lower filtration rates in most water-based drilling fluid systems
- Helps improve borehole stability
- Helps flocculate dispersed drill cuttings in clear water drilling

Advantages

- Helps maintain filtration control without detrimental viscosity increase
- Effective with fast drilling non-dispersed systems
- Helps decrease clay dispersion

Typical Properties

Appearance:	Fine or granulated powder
Specific Gravity:	1.5

Recommended Treatment

To help reduce filtration in drilling fluids, add 2-6 lb/bbl (5.7-17.1 kg/m³) of DEXTRID LTE filtration control additive slowly through the hopper

Note: Small amounts of PAC™ filtration control additive will complement DEXTRID LTE filtration control additive in fresh and salty drilling fluids..

Packaging

DEXTRID LTE filtration control additive is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks.

DRILTREAT®

WETTING AGENT

Product Description

DRILTREAT® wetting agent is a powerful oil wetting product used to oil wet drill solids and weighting agents in oil-based drilling fluids. Reduced flow properties are commonly seen after small applications of this product. DRILTREAT wetting agent can also be used to wet/adhere to the surfaces of naturally-occurring natural gas hydrate formations to retard their dispersion and disintegration in a water-based drilling fluid.

Applications/Functions

- Helps promote oil-wetting of solids in oil-based muds
- Helps increase the resistance of oil-based muds to water contamination
- Helps reduce interparticle forces when formulating very high density oil-based fluids

Advantages

- Helps act as a secondary emulsifier
- Helps improve flow properties
- Helps coat the surfaces of shale and other solids

Typical Properties

Appearance:	Clear viscous amber liquid
Flash point,>:	200°F (93°C)
pH, (10% aqueous solution)	6.5
Specific gravity:	1

Recommended Treatment

Add 0.25-3.0 lb/bbl (0.71-5.71 kg/m³) of DRILTREAT wetting agent directly to the system.

Packaging

DRILTREAT wetting agent is packaged in 5-gal (18.9-l) pails, 55-gal (208-l) drums and in bulk.

DURATONE® E

FILTRATION CONTROL AGENT

Product Description

DURATONE® E filtration control agent is a modified lignitic product which is the primary filtration control additive for conventional INVERMUL® and ENVIROMUL™ invert emulsion drilling fluid systems. DURATONE E filtration control agent is used in geographical areas where local environmental regulations prohibit the use of DURATONE HT filtration control agent. DURATONE E filtration control agent is not used in organoclay-free high performance invert emulsion systems. DURATONE E filtration control agent can effectively control and reduce HTHP Filtrate at temperatures beyond 425ºF (218ºC). DURATONE E filtration control agent can act synergistically with the emulsifiers in conventional invert emulsion fluid systems to enhance the overall emulsion and thermal stability of the fluid system. DURATONE filtration control agent is particularly effective in deep hot wellbore applications.

Applications/Functions

- Helps reduce HTHP filtration rate
- Helps promote stability of invert emulsion fluid systems

Advantages

- Helps increase thermal stability of drilling fluids at temperatures beyond 425ºF (218ºC)
- Effective in all invert emulsion fluid systems

Typical Properties

- Appearance: Gray to black powder
- Bulk density, compacted: 44lb/ft³ (705kg/m³)
- Bulk density, uncompacted: 31lb/ft³ (497kg/m³)
- Specific gravity: 1.8

Recommended Treatment

Add 2-20 lb/bbl (5.7-57 kg/m³) of DURATONE E filtration control agent. Concentration will depend on the degree of filtration control desired.

Packaging

DURATONE E filtration control agent is packaged in 50-lb (22.7-kg) sacks.

DURATONE® HT

FILTRATION CONTROL AGENT

Product Description

DURATONE® HT filtration control agent is a modified lignitic product which is the primary filtration control additive for INVERMUL® and ENVIROMUL™ conventional invert emulsion drilling fluid systems. DURATONE HT filtration control agent is not used in organo clay-free high performance invert emulsion systems. DURATONE HT filtration control agent can effectively control and reduce HTHP Filtrate at temperatures reaching 500°F (260°C). DURATONE HT filtration control agent can act synergistically with the primary and secondary emulsifiers in conventional Invert Emulsion fluid systems to enhance the overall emulsion and thermal stability of the fluid system. DURATONE HT filtration control agent is replaced with DURATONE E filtration control agent to comply with local environmental regulations.

Applications/Functions

- Helps reduce HTHP filtration rate
- Helps promote stability of invert emulsions fluids

Advantages

- Helps increase thermal stability of drilling fluids at temperatures reaching 500°F (260°C)
- Effective in all oil and invert emulsion systems

Typical Properties

Appearance:	Gray to black
Bulk density, compacted:	44lb/ft³
Bulk density, uncompacted:	31lb/ft³
Bulk density, compacted:	705kg/m³
Bulk density, uncompacted:	497kg/m³
Specific gravity:	1.8

Recommended Treatment

Add 2-20 lb/bbl (5.7-57.1 kg/m³) of DURATONE HT filtration control agent. Concentration will depend on the degree of filtration control desired.

Packaging

DURATONE HT filtration control agent is packaged in 50-lb (22.7-kg) sacks.

EZ MUL®

EMULSIFIER

Product Description

EZ MUL® emulsifier is both a secondary emulsifier and oil-wetting agent suitable for use in diesel oil based drilling fluid systems. EZ MUL emulsifier can be used as the primary emulsifier in INVERMUL® RF relaxed filtrate fluid systems. EZ MUL emulsifier has minimal alkalinity requirements. When EZ MUL emulsifier is used in conjunction with INVERMUL emulsifier, high temperature stable invert emulsions with low filtration rates can be obtained.

Applications/Functions

- Prepare INVERMUL and INVERMUL RF fluid systems
- Promote oil-wetting in invert emulsion systems
- Improve electrical stability measurements
- Reduce flow properties of invert emulsions

Advantages

- Effective at low concentrations
- Can be added directly to the system
- Thermally stable at temperatures greater than 500ºF (260ºC)
- Compatible with other oil-based mud additives

Typical Properties

Appearance:	Thick, dark liquid
Flash point, PMCC:	178ºF (81ºC)
Specific gravity:	0.95

Recommended Treatment

1. For INVERMUL RF systems, add 4-12 lb/bbl (11.4-34.2 kg/m³) directly to the system.

2. For an INVERMUL system, add 2-6 lb/bbl (5.7-17.1 kg/m³) directly to the system.

Packaging

EZ MUL emulsifier is packaged in 55-gal (208-l) drums and in bulk.

EZ MUL® NS

EMULSIFIER

Product Description

EZ MUL® NS emulsifier is an invert emulsifier and oil-wetting agent for mineral oil, paraffin and XP-07™ base oil drilling fluid systems. EZ MUL NS emulsifier carries a Norway North Sea yellow-rating and is particularly well suited for fluids used in areas with North Sea environmental regulations. EZ MUL NS emulsifier is even more environmentally responsible than EZ MUL® NT emulsifier. EZ MUL NS emulsifier has minimal alkalinity requirements.

Applications/Functions

- Helps prepare ENVIROMUL™, INNOVERT® and XP-07 fluid systems
- Helps prepare environmentally acceptable NAP fluids
- Helps promote oil-wetting in invert emulsion systems
- Helps improve electrical stability measurements
- Helps reduce flow properties of invert emulsions

Advantages

- Effective in small concentrations
- Can be added directly to the system
- Thermally stable at temperatures greater than 260ºC (500ºF)
- Compatible with other oil-based mud additives
- Low pour point for applications in colder areas

Typical Properties

Appearance	Thick red-amber liquid
Flash point, PMCC	65ºC (81ºF)
Specific gravity	0.96

Recommended Treatment

For ENVIROMUL, INNOVERT and XP-07 fluid systems, add 17-34 kg/m³ (6-12 lb/bbl) directly to the system.

Packaging

EZ MUL NS emulsifier is packaged in 55-gal (208-l) drums, l-m3 IBC (960-kg) and in bulk.

EZ MUL® NT

EMULSIFIER

Product Description

EZ MUL® NT emulsifier is an invert emulsifier and oil-wetting agent for mineral oil and paraffin based drilling fluid systems. EZ MUL NT emulsifier is used as the secondary emulsifier in INVERMUL® RF fluid systems. EZ MUL NT emulsifier has minimal alkalinity requirements. When EZ MUL NT emulsifier is used in conjunction with INVERMUL NT emulsifier, high temperature stable invert emulsions with low filtration rates can be obtained.

Applications/Functions

- Helps prepare ENVIROMUL™ and INVERMUL RF systems
- Helps promote oil-wetting in invert emulsion systems
- Helps improve electrical stability measurements
- Helps reduce flow properties of invert emulsions

Advantages

- Effective in small concentrations
- Can be added directly to the system
- Thermally stable at temperatures greater than 500ºF (260ºC)
- Compatible with other oil-based mud additives

Typical Properties

- Appearance: Thick red-amber liquid
- Flash point, PMCC: 149ºF (65ºC)
- Specific gravity: 0.96

Recommended Treatment

For ENVIROMUL and INVERMUL RF systems, add 4-12 lb/bbl (11.4-34.2 kg/m³) directly to the system.

For an INVERMUL system, add 2-6 lb/bbl (5.7-17.1 kg/m³) directly to the system.

Packaging

EZ MUL NT emulsifier is packaged in 55-gal (208-l) drums containing 400-lb (181-kg) net weight and in 418-lb (190-kg) drums or bulk.

EZ SPOT®

PIPE-FREEING AGENT

Product Description

EZ SPOT® pipe-freeing agent can be mixed with base oil and water to rapidly create an invert emulsion that is effective stuck pipe pill. EZ SPOT pipe-freeing agent lubricates and dehydrates filter cake from water-based fluids to aid in breaking the cake apart to help alleviate differentially stuck drill pipe. EZ SPOT pipe-freeing agent is preferred when a weighted spot is desired to match the system density and can be used as a spacer fluid between oil based drilling fluids and cement.

Applications/Functions

- Formulate a pill to help release differently stuck pipe
- Helps prevent interfacial thickening of oil-based mud and cement during cementing
- Helps emulsify water in oil-based fluids

Advantages

- Thermally stable at temperatures up to 400°F (205°C)
- Can be formulated with varying oil/water ratios
- Liquid concentrate for ease of addition
- Easily weighted with any weighting agent

Typical Properties

- Appearance: Thick, brownish-green liquid
- Flash Point, PMCC: 88°F
- Flash Point, PMCC: 31°C
- Specific gravity: 0.98

Recommended Treatment

See the table for the amounts of base oil, barite, water and EZ SPOT pipe-freeing agent fluid concentrate for 100 bbl (16 m^3) of spotting fluid.

An additional viscosifier such as GELTONE® II may be required to suspend barite in weighted fluids.

Packaging

EZ SPOT pipe-freeing agent is packaged in a variety of sizes including 15-gal (56.7-l), 55-gal (208-l) drums in bulk, and others.

EZ SPOT Fluid: Spotting Fluid Formulation for 100 bbl (16 m³).

Density, lb/gal	7.3	10	12	14	16	18
Oil/Water Ratio	70/30	70/30	70/30	70/30	82/18	82/18
Base Oil, bbl	65	58	54	49	51	44
EZ SPOT fluid, drum	6	6	6	6	6	6
Water, bbl	28	26	22	21	11	10
BAROID® material, 100lb sacks (45.4 kg)	-	140	250	350	465	570

EZ-PLUG®

LOST CIRCULATION MATERIAL

Product Description

EZ-PLUG® lost circulation material is a blend of acid soluble particulates and fiber in a pellet form and is designed to be used in reservoir sections. It may be used in both non-aqueous and water base fluids individually.

Applications/Functions

- Seepage loss control
- Bridge across permeable formations
- Plug voids, fractures, and microfractures
- Helps minimize damage due to solids
- Helps minimize fluid invasion in production zone

Advantages

- Acid soluble
- Formulated to work in conjunction with drill-in systems
- Compatible with all drilling and completion fluids
- Can disperse easily in clear brines
- Particle size distribution designed for all types of losses

Typical Properties

Appearance	Gray to tan granules
Specific gravity	2.6
Acid solubility, (15% HCl)	97%

Recommended Treatment

EZ-PLUG lost circulation material can be added directly through the mud hopper.

- For normal treatment, add 5-10 lb/bbl (14.3-28.5 kg/m³) of EZ-PLUG lost circulation material
- For seepage losses, add 15-30 lb/bbl (42.8-85.6 kg/m³) of EZ-PLUG lost circulation material
- For severe losses, add 70-90 lb/bbl (200-256 kg/m³) of EZ-PLUG lost circulation material

Packaging

EZ-PLUG lost circulation material is packaged in 40-lb (18.1-kg) bags.

GELTONE® V

VISCOSIFIER

Product Description

GELTONE® V viscosifier is an organophilic clay used to impart viscosity and suspension properties to oil-based drilling fluids. GELTONE V viscosifier is also used to gel oil drilling fluids for long-term suspension of weighting agents in drilling and packer fluids. GELTONE V viscosifier typically yields more slowly than GELTONE II viscosifier but will reach the same final viscosity, usually after one trip through the drilling bit. GELTONE V viscosifier is usually preferred in diesel oil-based fluids. GELTONE V viscosifier is stable to 400º (204ºC). GELTONE V viscosifier should not be used in high-performance clay-free oil-based drilling fluids.

Applications/Functions

- Helps viscosify any oil-based drilling fluid
- Helps improve hole cleaning during drilling and workover operations
- Gel oil muds for long-term suspension of weighting agents in packer fluids and casing packs

Advantages

- Stable at temperatures approaching 400ºF (204ºC)
- Aids in filtration control

Typical Properties

- Appearance: Gray-tan powder
- Specific gravity: 1.6

Recommended Treatment

Add 1-15 lb/bbl (2.86-42.80 kg/m³) of GELTONE V viscosifier slowly through the hopper.

Note: Decrease yielding time by adding a small stream of water through the hopper at the same time.

Packaging

GELTONE V viscosifier is packaged in 50-lb (22.7-kg) sacks.

GEM™ QP

SHALE STABILIZER

Product Description

GEM™ QP shale stabilizer is a specialized blend of polyglycols that can be used in water-based drilling fluids to help improve lubricity and shale stability. It has been formulated to provide a specific range of cloud point behavior in potassium chloride brine-based fluids to prevent hydration, swelling and sticking of reactive clays. GEM QP shale stabilizer also helps to reduce bit-balling, is compatible with most water-based drilling fluids and is unaffected by most common contaminants. GEM QP shale stabilizer is acceptable for offshore use in many environmentally sensitive areas worldwide.

Applications/Functions

- Helps stabilize reactive formations
- Helps to improve fluid stability
- Helps reduce bit-balling tendencies and accretion of reactive shales

Advantages

- Compatible with most water-based drilling fluids using KCl or NaCl salts
- Specific range of cloud point
- Environmentally responsible

Typical Properties

Appearance:	Dark yellow to brown liquid
pH:	7-9
Specific gravity:	0.98-1.01
Cloud point:	3% (w/v) in 10.5% (w/v) KCl: 115-131°F (46-55°C)

Recommended Treatment

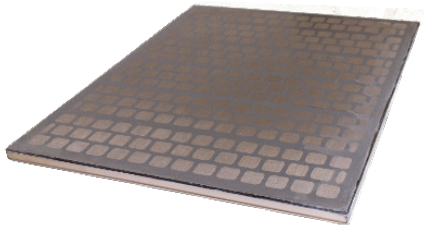
Add 2-5 percent by volume to the mud system.

Packaging

GEM QP shale stabilizer is available in 55-gal (208-l) drums.

BaraMesh® Shale Shaker Screens

REPLACEMENT SCREENS COMPATIBLE WITH NOV VSM 300 SHAKER



The Halliburton BaraMesh® shale shaker screens are designed to deliver efficient solids removal, longevity, and desired cutpoints.

API RP 13C compliant

Technical Specifications

Screen Description	SAP Number	Conductance (kilodarcies/mm)	Non-Blanked Area (ft^2)	API Screen Number	D_{100} (micron)
SCR V30 SC G API 10	202480	75.63	5.32	10	1900
SCR V30 SC G API 20	202481	21.46	5.32	20	864
SCR V30 SC G API 30	202482	12.67	5.32	30	605
SCR V30 SC G API 40	202483	8.93	5.32	40	440
SCR V30 MTL BM API 45	102710659	5.66	4.17	45	381
SCR V30 MTL BM API 50	102710660	4.45	4.17	50	326
SCR V30 MTL BM API 60	102710661	3.34	4.17	60	252
SCR V30 MTL BM API 70	102710662	3.03	4.17	70	215
SCR V30 MTL BM API 80	102710663	2.50	4.17	80	192
SCR V30 MTL BM API 100	102710664	2.26	4.17	100	163
SCR V30 MTL BM API 120	102710665	1.59	4.17	120	130
SCR V30 MTL BM API 140	102710666	1.35	4.17	140	103
SCR V30 MTL BM API 170	102710667	1.27	4.17	170	85
SCR V30 MTL BM API 200	102710668	0.84	4.17	200	73
SCR V30 MTL BM API 230	102710669	0.74	4.17	230	67
SCR V30 MTL BM API 270	102710670	0.67	4.17	270	55
SCR V30 MTL BM API 325	102710678	0.50	4.17	325	45

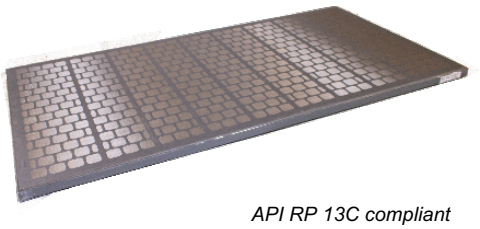
Weight and Dimensions:

	Scalper (SC)	Primary
Dimensions (L x W x H)	**36 ½ in x 26 in x 1 ½ in**	**35 in x 27 in x 1 ½ in**
Weight	24 lbs	24 lbs

BaraMesh® Shale Shaker Screens

REPLACEMENT SCREENS COMPATIBLE WITH NOV KING COBRA VENOM SHAKER

The Halliburton BaraMesh® shale shaker screens are designed to deliver efficient solids removal, longevity, and desired cutpoints.



API RP 13C compliant

Technical Specifications

Screen Description	SAP number	Conductance (kilodarcies/mm)	Non-Blanked Area (ft^2)	API Screen Number	D_{100} (micron)
SCR CVN MTL BM API 45	912125	5.66	5.60	45	381
SCR CVN MTL BM API 50	565281	4.45	5.60	50	326
SCR CVN MTL BM API 60	565282	3.34	5.60	60	252
SCR CVN MTL BM API 70	912126	3.03	5.60	70	215
SCR CVN MTL BM API 80	565283	2.50	5.60	80	192
SCR CVN MTL BM API 100	565284	2.26	5.60	100	163
SCR CVN MTL BM API 120	565285	1.59	5.60	120	130
SCR CVN MTL BM API 140	565286	1.35	5.60	140	103
SCR CVN MTL BM API 170	567393	1.27	5.60	170	85
SCR CVN MTL BM API 200	567394	0.84	5.60	200	73
SCR CVN MTL BM API 230	567392	0.74	5.60	230	67
SCR CVN MTL BM API 270	202363	0.67	5.60	270	55
SCR CVN MTL BM API 325	912137	0.50	5.60	325	45

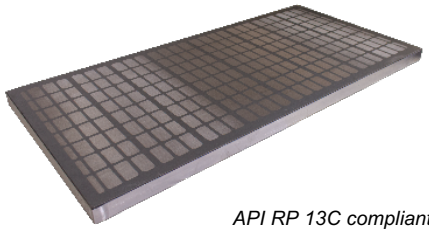
Weight and Dimensions:

Dimensions (L x W x H)	**49 ¼ in x 25 in x 1 ¼ in**
Weight	33 lbs

BaraMesh® Shale Shaker Screens

REPLACEMENT SCREENS COMPATIBLE WITH MI SWACO MONGOOSE SHAKER

The Halliburton BaraMesh® shale shaker screens are designed to deliver efficient solids removal, longevity, and desired cutpoints.



API RP 13C compliant

Technical Specifications

Screen Description	SAP Number	Conductance (kilodarcies/mm)	Non-Blanked Area (Ft^2)	API Screen Number	D_{100} (Micron)
SCR SMG MTL BM API 45	458756	5.66	5.02	45	381
SCR SMG MTL BM API 50	389369	4.45	5.02	50	326
SCR SMG MTL BM API 60	389370	3.34	5.02	60	252
SCR SMG MTL BM API 70	912140	3.03	5.02	70	215
SCR SMG MTL BM API 80	389371	2.50	5.02	80	192
SCR SMG MTL BM API 100	389372	2.26	5.02	100	163
SCR SMG MTL BM API 120	389373	1.59	5.02	120	130
SCR SMG MTL BM API 140	389374	1.35	5.02	140	103
SCR SMG MTL BM API 170	561946	1.27	5.02	170	85
SCR-SMG MTL BM API 200	561947	0.84	5.02	200	73
SCR SMG MTL BM API 230	580963	0.74	5.02	230	67
SCR SMG MTL BM API 270	580960	0.67	5.02	270	55
SCR SMG MTL BM API 325	912141	0.50	5.02	325	45

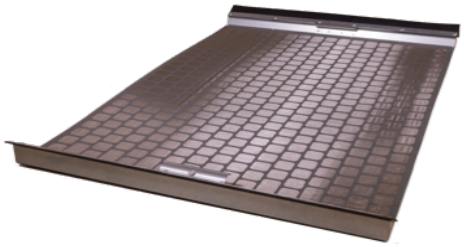
Weight and Dimensions:

Dimensions (L x W x H)	**46 in x 23 in x 1 5/8 in**
Weight	25 lbs

BaraMesh® Shale Shaker Screens

REPLACEMENT SCREENS COMPATIBLE WITH DERRICK 500 SERIES SHAKERS

The Halliburton BaraMesh® shale shaker screens are designed to deliver efficient solids removal, longevity, and desired cutpoints.



Technical Specifications

API RP 13C compliant

Screen Description	SAP Number	Conductance (kilodarcies/mm)	Non-Blanked Area (ft^2)	API Screen Number	D_{100} (micron)
SCR MD500 MTL BM API 45	912147	5.66	5.15	45	381
SCR MD500 MTL BM API 50	912148	4.45	5.15	50	326
SCR MD500 MTL BM API 60	912149	3.34	5.15	60	252
SCR MD500 MTL BM API 70	912150	3.03	5.15	70	215
SCR MD500 MTL BM API 80	835782	2.50	5.15	80	192
SCR MD500 MTL BM API 100	835783	2.26	5.15	100	163
SCR MD500 MTL BM API 120	912151	1.59	5.15	120	130
SCR MD500 MTL BM API 140	912152	1.35	5.15	140	103
SCR MD500 MTL BM API 170	912153	1.27	5.15	170	85
SCR MD500 MTL BM API 200	962298	0.84	5.15	200	73
SCR MD500 MTL BM API 230	912154	0.74	5.15	230	67
SCR MD500 MTL BM API 270	912155	0.67	5.15	270	55
SCR MD500 MTL BM API 325	912156	0.50	5.15	325	45

Weight and Dimensions:

Dimensions (L x W x H)	41 ½ in x 27 $^3/_8$ in x 2 in
Weight	13 lbs

BaraMesh® Shale Shaker Screens

REPLACEMENT SCREENS COMPATIBLE WITH DERRICK Model 48 FLC2000 SERIES SHAKERS

The Halliburton BaraMesh® shale shaker screens are designed to deliver efficient solids removal, longevity, and desired cutpoints.

Technical Specifications

API RP 13C compliant

Screen Description	SAP Number	Conductance (kilodarcies/mm)	Non-Blanked Area (ft^2)	API Screen Number	D_{100} (micron)
SCR D48 MBH BM API 45	912144	5.66	5.59	45	381
SCR D48 MBH BM API 50	560722	4.45	5.59	50	326
SCR D48 MBH BM API 60	560723	3.34	5.59	60	252
SCR D48 MBH BM API 70	912145	3.03	5.59	70	215
SCR D48 MBH BM API 80	560724	2.50	5.59	80	192
SCR D48 MBH BM API 100	560725	2.26	5.59	100	163
SCR D48 MBH BM API 120	560726	1.59	5.59	120	130
SCR D48 MBH BM API 140	560747	1.35	5.59	140	103
SCR D48 MBH BM API 170	355940	1.27	5.59	170	85
SCR D48 MBH MB API 200	398738	0.84	5.59	200	73
SCR D48 MBH BM API 230	1073028	0.74	5.59	230	67
SCR D48 MBH BM API 270	1073029	0.67	5.59	270	55
SCR D48 MBH BM API 325	912146	0.50	5.59	325	45

Weight and Dimensions:

Dimensions (L x W x H)	41 ½ in x 27 $^3/_8$ in x 1in
Weight	11 lbs (Packaged 3 Screens per Box)

BaraMesh® Shale Shaker Screens

REPLACEMENT SCREENS COMPATIBLE WITH M-I SWACO BEM 600 / 650 SHAKERS

The Halliburton BaraMesh® shale shaker screens are designed to deliver efficient solids removal, longevity, and desired cutpoints.

Technical Specifications

API RP 13C compliant

Screen Description	SAP Number	Conductance (kilodarcies/mm)	Non-Blanked Area (ft^2)	API Screen Number	D_{100} (micron)
SCR BEM MTL G API 20	912159	21.46	4.49	20	864
SCR BEM MTL G API 35	912160	10.12	4.49	35	503
SCR BEM MTL BEM API 45	912161	5.66	4.49	45	381
SCR BEM MTL BEM API 50	912162	4.45	4.49	50	326
SCR BEM MTL BEM API 60	912163	3.34	4.49	60	252
SCR BEM MTL BEM API 70	912164	3.03	4.49	70	215
SCR BEM MTL BEM API 80	912165	2.50	4.49	80	192
SCR BEM MTL BEM API 100	912166	2.26	4.49	100	163
SCR BEM MTL BEM API 120	912167	1.59	4.49	120	130
SCR BEM MTL BEM API 140	912168	1.35	4.49	140	103
SCR BEM MTL BEM API 170	912169	1.27	4.49	170	85
SCR BEM MTL BEM API 200	912170	0.84	4.49	200	73
SCR BEM MTL BEM API 230	912171	0.74	4.49	230	67
SCR BEM MTL BEM API 270	912172	0.67	4.49	270	55

Weight and Dimensions:

Dimensions (L x W x H)	**36 in x 27 ½ in x 1 5/8 in**
Weight	26 lbs (Packaged 3 Screen per Box)

BaraMesh® Shale Shaker Screens

REPLACEMENT SCREENS COMPATIBLE WITH M-I SWACO MD3 SHAKERS

The Halliburton BaraMesh® shale shaker screens are designed to deliver efficient solids removal, longevity, and desired cutpoints.

Technical Specifications

API RP 13C compliant

Screen Description	SAP Number	Conductance (kilodarcies/mm)	Non-Blanked Area (ft^2)	API Screen Number	D_{100} (micron)
SCR MD3-B MTL G API 20	1127168	21.46	2.69	20	864
SCR MD3-B MTL G API 35	1127169	10.12	2.69	35	503
SCR MD3-B MTL G API 45	1127171	5.66	2.69	45	381
SCR MD3-B MTL BM API 50	1127172	4.45	2.69	50	326
SCR MD3-B MTL BM API 60	1127173	3.34	2.69	60	252
SCR MD3-B MTL BM API 70	1127174	3.03	2.69	70	215
SCR MD3-B MTL BM API 80	1127175	2.50	2.69	80	192
SCR MD3-B MTL BM API 100	1127176	2.26	2.69	100	163
SCR MD3-B MTL BM API 120	1127187	1.59	2.69	120	130
SCR MD3-B MTL BM API 140	1127188	1.35	2.69	140	103
SCR MD3-B MTL BM API 170	1127189	1.27	2.69	170	85
SCR MD3-B MTL BM API 200	1127190	0.84	2.69	200	73
SCR MD3-B MTL BM API 230	1127191	0.74	2.69	230	67
SCR MD3-B MTL BM API 270	1127192	67	2.69	270	55

Weight and Dimensions:

Dimensions (L x W x H)	**23-5/8” x 25-3/4” x 1-1/2”**
Weight	9 Kg / 20 lbs per panel (One panel per box)

IMPERMEX®

FILTRATION CONTROL ADDITIVE

Product Description

IMPERMEX® filtration control additive is a pre-gelatonized starch that can provide filtration control in water-based drilling fluids up to 250°F (121°C). It is effective in most water-based fluids ranging from fresh-water to high concentrations of monovalent salts and low concentrations of divalent ions. IMPERMEX filtration control additive is susceptible to bacterial degradation and should be used with a biocide such as ALDACIDE® G™ biocide to control bacterial action. Consider DEXTRID® filtration control additive products for improved performance.

Applications/Functions

IMPERMEX filtration control additive can be used to reduce fluid loss in most water-based drilling fluids

Advantages

- Stable at temperatures up to 250°F (121°C)
- Effective in lime-based and gypsum-based systems
- More cost-effective than other polymeric filtration control agents

Typical Properties

Appearance:	White powder
Specific Gravity:	1.5
Flash point:	360 – 575°F (182 – 302°C)

Recommended Treatment

Add 2-8 lb/bbl (5.71-22.82 kg/m³) of IMPERMEX filtration control additive slowly through the hopper.

Note: IMPERMEX filtration control additive is susceptible to bacterial degradation, and it requires a preservative such as ALDACIDE G biocide to eliminate bacterial action.

Packaging

IMPERMEX filtration control additive packaged in 50-lb (22.7-kg) sacks.

IRON-THIN™

THINNER

Product Description

IRON-THIN™ thinner is a chrome-free iron lignosulfonate that helps control flow properties and filtration rates of water-based dispersed drilling fluids. The absence of added chrome makes IRON-THIN thinner ideally suited for use in areas where environmental concerns may limit the presence of chrome in drilling fluid systems. It can be used in fresh water or sea water based fluids at temperatures up to 350°F (177°C).

Applications/Functions

- Helps improve flow properties in all kinds of water-based drilling fluids
- Helps improve effective control of filtration rates for water-based muds approaching 350°F (177°C)

Advantages

- Chrome-free, low toxicity thinner for environmentally sensitive areas
- Helps provide effective contaminant tolerance against drilled solids, salt, cement, and anhydrite
- Effective at low pH ranges (8.0 – 9.5)
- Can be used in fresh water or sea water

Typical Properties

Appearance:	Brown to black powder solid
pH, (10% aqueous solution):	5.5 maximum
Specific Gravity:	1.1
Bulk Density:	25lb/ft³ (400kg/m³)
Solubility:	Water soluble

Recommended Treatment

- For freshwater systems add 2-6 lb/bbl (5.7-17.1 kg/m^3) to the active mud system
- For sea water systems add 2-8 lb/bbl (5.7-22.8 kg/m^3) to the active mud system.

Packaging

IRON-THIN thinner is packaged in 55.1-lb (25-kg) bags.

LE SUPERMUL™

EMULSIFIER

Product Description

LE SUPERMUL™ emulsifier is a highly active invert emulsifier and oil-wetting agent for synthetic based drilling fluid systems. LE SUPERMUL emulsifier is suitable for all invert emulsion systems and is the primary emulsifier of BaraXcel™ drilling fluids.

Applications/Functions

- Helps promote oil-wetting in invert emulsion systems
- Helps improve electrical stability measurements
- Helps to build optimum flow properties in invert emulsions

Advantages

- Effective in small concentrations
- Can be added directly to the system
- Thermally stable at temperatures greater than 500ºF (260ºC)
- Compatible with other oil-based and synthetic mud additives and systems

Typical Properties

Appearance:	Amber liquid
Flash point:	>200°F (93°C)
Specific gravity:	0.913

Recommended Treatment

For BaraXcel systems, add 6-16 lb/bbl (17.1-45.6 kg/m³) directly to the system.

Packaging

LE SUPERMUL emulsifier is packaged in 55-gal (208-l) drums or bulk.

LIQUITONE®

FILTRATION CONTROL ADDITIVE

Product Description

LIQUITONE® filtration control additive is a liquid synthetic copolymer that can be used for filtration control in all invert emulsion drilling fluids. LIQUITONE filtration control agent can also provide secondary fluid viscosity and improve rheology build in low density fluids made with low viscosity base fluids. The product may be used as a standalone filtration control additive or can be added in combination with other types of filtration control products.

Applications/Functions

- Helps to reduce High Pressure High Temperature (HPHT) filtration rates
- Can increase rheological properties

Advantages

- Can reduce formulation requirements for viscosifiers and rheology modifier additives
- Effective in all invert emulsion fluids
- Easily mixed with rapid results
- Can reduce HPHT filtrate at temperatures up to 350°F (177°C)

Typical Properties

Appearance:	Milky white liquid
Specific gravity:	0.98
Freezing point:	32°F (0°C)

Recommended Treatment

Add 1-4 lb/bbl (2.9-11.4 kg/m^3) of LIQUITONE filtration control additive. Utilize the full contents of opened drums as the product can polymerize when exposed to air.

Packaging

LIQUITONE filtration control additive is packaged in 55 gal (205-Liter) drums.

LiquiVis® EP

VISCOSIFIER

Product Description

LiquiVis® EP viscosifier is a high purity HEC polymer dispersed in a water soluble carrier. It is designed to viscosify fresh water and low weight brines for drill-in fluid applications. LiquiVis EP viscosifier does not increase gel strength or provide improved fluid loss control. LiquiVis EP viscosifier can also be used to prepare displacement spacers and clean the hole while milling. This product mixes easily in all brines, is acid soluble, and is suitable for use up to 200°F (93°C).

Applications/Functions

- Clean the hole while milling or underreaming
- Viscosify carrier fluids used for gravel packing
- Prepare spacer for displacement
- Friction reducer for coiled tubing applications

Advantages

- Contains no petroleum hydrocarbons that may cause sheening
- Does not form lumps or fish-eyes
- Does not contain organophilic clays
- Minimizes formation damage
- Disperses easily into fresh water or brine with minimum shear
- Can develop a smooth, uniform viscosity

Typical Properties

Appearance	Off-white suspension
Flash point, PMCC	> 200°F (93°C)
Pour point	< 50°F (10°C)
Specific gravity, @ 75°F (23.9°C)	1.08

Recommended Treatment

- Mix 0.3 to 2.0 gal/bbl (0.72-47.6 l/m³) of LiquiVis EP viscosifier per barrel of fluid according to the brine type
- Add through mixing hopper if available
- Mix LiquiVis EP viscosifier with water or brine having a neutral pH for maximum effectiveness

Note: Viscosity can be enhanced by raising the pH after the LIQUI-VIS EP viscosifier has dispersed.

Packaging

LiquiVis EP viscosifier is packaged in 5-gal (18.9-l) cans containing 45-lb (20.4-kg) net weight.

N-DRIL™ HT PLUS™

FILTRATION CONTROL ADDITIVE

Product Description

N-DRIL™ HT PLUS™ filtration control additive is a cross-linked starch product intended for reducing HTHP filtrate loss for water based fluids, particularly in reservoir sections. N-DRIL HT PLUS filtration control additive is suitable for use in all water-based fluids including drilling, completion, and work-over fluids. It has minimal damage characteristics and is readily removed with acid or N-FLOW™ delayed acid generators. When used with oxygen scavengers or within formate brines, N-DRIL HT PLUS filtration control additive is effective up to 300°F (149°C).

Applications/Functions

N-DRIL HT PLUS filtration control additive, when used with properly sized bridging/weighting particles, can:

- Provide filtration control
- Minimize damage to the productive formation

Advantages

- Suitable for all water-based drilling fluids, workover and completions fluids including: sea water, potassium chloride, magnesium chloride, sodium chloride, sodium bromide, calcium bromide, and zinc bromide.
- Resists calcium contamination over a wide pH range
- Soluble in acids and oxidizers
- Cleans up readily following drilling, workover, or completion operations
- Environmentally responsible, presenting no toxicity or ecological problems

Typical Properties

Appearance:	White, free-flowing powder
Specific Gravity:	1.5

Recommended Treatment

Disperse N-DRIL HT PLUS filtration control additive through conventional mud mixing equipment.

Concentrations range from 3-9 lb/bbl (9 - 26 kg/m^3).

Packaging

N-DRIL HT PLUS filtration control additive is packaged in 50-lb (22.7-kg) sacks.

ADAPTA® LE

FILTRATION CONTROL ADDITIVE

Product Description

ADAPTA® LE filtration control agent provides a rapid reduction in the HTHP filtrate of non-aqueous fluid (NAF) systems. This product has been designed to function similarly to other copolymer additives for moderate to standard operating temperatures. ADAPTA LE is a liquid polymer suspension, which also may provide secondary viscosity to the fluid system.

Applications/Functions

- Reduces HTHP filtrate at temperatures up to and beyond 300^{0}F
- Flows through fine mesh shaker screens due to its very small particle size

Advantages

- Effective in small doses
- Can be blended with all types of NAF systems to provide excellent filtration control
- Cold-temperature stable
- Eliminates dust from other dry polymer powdered additives
- Manufactured in Europe for availability to North Sea and other nearby operating areas

Typical Properties

Appearance:	Liquid polymer latex
Solubility:	Oil-dispersible suspension in water
Specific gravity:	0.98 – 1.02

Recommended Treatment

Add 0.5-6.0 lb./bbl. (1.4-17.1 kg/ m^3) of ADAPTA LE filtration control agent to fluid systems to achieve the required level of filtration control.

Packaging

ADAPTA LE filtration control agent is available in bulk containers, 275-gallon totes (2,310 lbs. net), 55-gallon drums (462 lbs. net), and 5-gallon cans (42 lbs. net).

TAU-MOD® ULTRA

VISCOSIFIER

Product Description

TAU-MOD® ULTRA viscosifier is used to improve fluid stability, weight material suspension and hole cleaning capacity in high performance invert emulsion drilling fluids built using organophilic clay-free technology. TAU-MOD ULTRA viscosifier is composed of a specialized grade of elongated inorganic particles that require some shear to achieve full yield. This particle matrix provides structure in the emulsion to aid the function of liquid polymeric rheology modifiers such as RHEMOD™ L viscosifier and BaraVis® IE-568 viscosifier.

Applications/Functions

- Helps viscosify organophilic clay-free systems (BaraXcel™ and BaraECD® drilling fluid systems)
- Improves hole cleaning and suspension during drilling and workover operations
- Extends liquid polymeric viscosifier products for maximum yield and long-term suspension of weighting agents
- Enhances low shear rheology and gel strengths

Advantages

- Does not contribute to cold-temperature viscosity increases in deepwater or arctic applications
- Highly effective in lower concentrations than original TAU-MOD
- Particle size and shape allow for the use of 325-mesh shaker screens with minimal depletion

Typical Properties

Appearance:	Cream colored powder
Specific gravity:	1.9-2.2 g/ml

Recommended Treatment

With BaraXcel 4 and BaraXcel 5 fluids, typical treatments range from 2.0 to 3.0 lb/bbl (5.7-8.6 kg/m^3). Low weight BaraXcel 1 and BaraXcel 3 systems (9.0-12.5 lb/gal density range) typically require a minimum of 3.0 lb/bbl (8.6 kg/m^3). Higher concentrations may be used if required. For optimum Tau zero values and gel strengths, additions of TAU-MOD ULTRA should continue even as drilled solids concentrations increase.

Packaging

TAU-MOD ULTRA viscosifier is packaged in 50-lb (22.7-kg) sacks.

N-FLOW™ 325

FILTER CAKE BREAKER

Product Description

N-FLOW™ 325 filter cake breaker is a delayed acid generator that is used for the slow release of acid. When spotted downhole N-FLOW 325 breaker reacts with water, generates acid and subsequently dissolves the calcium carbonate and polysaccharides in the filtecake removing fluid damage. N-FLOW breaker products can be placed across the entire interval before acid is generated, improving overall clean-up. N-FLOW 325 breaker is suitable for use in most brines at temperatures from 75 – 205°F (25 – 95°C) to give break times of up to 16 hours.

Applications/Functions

- Complete filtercake dissolution for openhole completions, particularly long horizontal intervals requiring accurate product placement before the onset of losses
- Low temperature applications can utilize BaraZyme W-1012 to assist in complete filtercake removal
- When combined with an appropriate water-wetting surfactant such as BaraKlean-926 or BaraSurf-442, N-FLOW 325 can be applied to remove non-aqueous filtercakes

Advantages

- Initial action is slow, fluid can be placed across entire interval before reaction sets in
- Less HSE concerns than for straight acid
- Minimal corrosion risk
- All components are environmentally acceptable
- No special containers, vessels, or pumps are required

Typical Properties

Appearance	Light Yellow Liquid
Specific gravity	1.2kg/L
Boiling point	510°F (240°C)
Vapor pressure, @ 20°C	15mm Hg
Flash point	230°F (100°C)

Recommended Treatment

A typical concentration of N-FLOW 325 filter cake breaker is between 10% and 20% (v/v), but in general, the optimum concentration should be identified on a case-by-case basis taking into account conditions such as completion technique hole diameter etc.

Packaging

N-FLOW 325 filter cake breaker is packaged in 210-kg drums and 1100-kg IBC tanks.

N-FLOW™ 408

FILTER CAKE BREAKER

Product Description

N-FLOW™ 408 filter cake breaker is a high temperature delayed acid generator that is used for the slow release of acid. When spotted down-hole N-FLOW 408 breaker reacts with water, generates acid and subsequently dissolves the calcium carbonate and cellulose in the filtercake removing fluid damage. N-FLOW breaker products can be placed across the entire interval before acid is generated improving overall clean-up. N-FLOW 408 breaker is suitable for use in most brines at temperatures from 194 – 265°F (90 – 130°C) to give break times of up to 16 hours.

Applications/Functions

- Complete filtercake dissolution for openhole completions, particularly long horizontal intervals requiring accurate product placement before the onset of losses
- When combined with an appropriate water-wetting surfactant such as BaraKlean-926 or BaraSurf-442, N-FLOW 408 can be applied to remove non-aqueous filtercakes

Advantages

- With a 10 hour half life at 100°C, N-FLOW 408 filter cake breaker will be more effective at higher temperatures than N-FLOW 325 filter cake breaker
- Initial action is slow, fluid can be placed across entire interval before reaction sets in
- No enzymes are necessary
- Less HSE concerns than for straight acid
- Minimal corrosion risk
- All components are environmentally acceptable
- No special containers or vessels are required

Typical Properties

Appearance	Colorless Liquid	Vapor pressure, @ 68°F (20°C)	2mm Hg
Specific gravity	1.042kg/L	Flash point	124°F (47°C)
Boiling point	338°F (154°C)		

Recommended Treatment

A typical concentration of N-FLOW 408 filter cake breaker is between 17% and 24% (v/v), but in general, the optimum concentration should be identified on a case-by-case basis taking into account conditions such as completion technique, hole diameter, etc.

Packaging

N-FLOW 408 filter cake breaker is packaged in 220-kg drums and 1000-kg IBC tanks

N-FLOW™ 412

FILTER CAKE BREAKER

Product Description

N-FLOW™ 412 filter cake breaker is a delayed acid generator used for the slow release of acid. When spotted downhole N-FLOW 412 reacts with water, generates organic acid, and subsequently dissolves the calcium carbonate and starch in the filter cake. This breaker can be placed across the entire interval before acid is generated, improving overall clean-up. N-FLOW 412 breaker is suitable for use in most brines at temperatures 85 - 110°C (185 - 230°F).

Applications/Functions

- Generates acid slowly over temperature range detailed above
- Reacts with and dissolves calcium carbonate and polysaccharides in the filter cake

Advantages

- Initial action is slow; the fluid can be placed across entire reservoir interval before reaction is complete
- No enzymes are necessary
- Less HSE concerns than for straight acid
- Minimal corrosion risk
- No special containers, vessels or pumps are required

Typical Properties

- Appearance: Clear colorless liquid
- Specific gravity: 1.09
- Flash point: 49°C / 121°F

Recommended Treatment

A typical concentration of N-FLOW 412 filter cake breaker is 17 – 24% v/v but this should be optimized on a case-by-case basis taking into account conditions such as hole diameter.

Packaging

N-FLOW 412 is packaged in 55 gal drums and 1,000 litre IBC tanks.

N-SEAL™

LOST CIRCULATION MATERIAL

Product Description

N-SEAL™ lost circulation material (LCM) is a specially formulated acid soluble extrusion spun mineral fiber, and is compatible with all oil and water-based mud systems. Nodules are formed into loosely connected groups so that when they are immersed in drilling fluids and subjected to agitation the nodules separate into individual fibers. Due to its solubility in weak acids, N-SEAL LCM is easily removed in production reservoirs.

Applications/Functions

- N-SEAL LCM can be used in concentrations of up to 30 lb/bbl (85.6 kg/m³) in slug treatments or as additive to the entire fluid system.
- Seepage control
- Bridging
- Plugging voids
- Fractures
- Work over operations
- Oil muds
- Water muds
- Completion fluids
- Cement additives

Advantages

- Acid soluble
- Easily-wetted
- Non-combustible
- Non-fermenting
- Inorganic
- Non-polluting
- Non-corrosive
- Non-toxic
- Temperature stable
- Contains no asbestos

Typical Properties

Appearance:	Gray white fiber
Specific gravity:	2.6

Recommended Treatment

1. N-SEAL LCM can be added directly through the hopper.
2. For normal treatment, add 5-8 lb/bbl (14.3-22.8 kg/m^3) of N-SEAL LCM.
3. As a pill, add 15-30 lb/bbl (42.8-85.6 kg/m^3) of N-SEAL LCM.
4. N-SEAL LCM is 98% acid soluble in 7.5% HCl or a blend of HCl and acetic acid.

Packaging

N-SEAL LCM is packaged in 30-lb (13.6-kg) sacks.

N-SOLATE® LV

HEAT TRANSFER FLUID

Product Description

N-SOLATE® LV packer fluid is a low viscosity aqueous packer fluid designed to facilitate heat transfer offering good freeze protection and low volatility. N-SOLATE® LV does not require an additional cross-linker and is easy to pump and place in the well. N-SOLATE® LV can be used at temperatures above 350°F (176°C) with the addition of N-SOLATE® LV Stabilizer. N-SOLATE® LV is suitable for offshore deepwater environments as well as land operations.

Applications/Functions

- Helps reduce annular pressure buildup to extend the life of wells
- Minimizes need to perform well interventions
- Non-mechanical method of heat flow control, significantly reducing well costs
- Minimizes wax and other deposits by maintaining temperature in the production tubing

Advantages

- Low viscosity system is easy to pump and place in the well
- Thermally stable up to 350°F due to absence of biopolymer viscosifiers (can be extended with N-SOLATE LV Stabilizer)
- Non-corrosive

Typical Properties

- Appearance: Colorless to pale yellow liquid
- Specific gravity: 1.04 – 1.05
- Viscosity: 25 cP

Recommended Use

Laboratory testing required to ensure N-SOLATE® LV will provide necessary level of insulation for individual cases.

Packaging

N-SOLATE® LV is available in bulk quantities.

N-VIS®

VISCOSIFIER

Product Description

N-VIS® viscosifier is a premium quality, clarified Xanthan gum polymer. It is used in DRIL-N® reservoir drill-in fluids to provide solids suspension and hole cleaning capabilities. It is designed to provide effective cuttings transport and hole cleaning capabilities, and to help minimize damage to reservoir formations. N-VIS viscosifier can be used in all brines up to 11.8 lb/gal (1.32 SG) and at up to 250°F (120°C).

Applications/Functions

N-VIS viscosifier can be used in the following applications:

- Drilling (including horizontal drilling, drill-in fluids, and under reaming)
- Gravel packing
- Sand-washing
- Well control

Note: The unique suspension properties of N-VIS viscosifier allow the design of bentonite-free systems

Advantages

- More effective than other oilfield polymer systems in removing solids, including those as dense as bauxite from the wellbore when sanding
- A highly refined, clarified xanthan biopolymer
- Can yield excellent suspension properties
- Can provide outstanding solids transport
- Helps minimize formation damage

Typical Properties

- Appearance: Dispersible beige powder
- Bulk density: 45lb/ft³ (721kg/m³)
- Mesh size, (% through 40 mesh): 95

Recommended Treatment

Hydrating polymer fluids prior to use. Monitor viscosity and filterability while mixing to assure complete hydration. Mixed at pH 3 to 6 as N-VIS viscosifier hydrates fastest at pH 8 to 10.

Note: High salt content or cold fluid temperatures can slow N-VIS viscosifier hydration. Allow more time for complete hydration in these situations..

Packaging

N-VIS viscosifier is packaged in 25-lb (11.3-kg) and 55.1-lb (25-kg) sacks.

N-VIS® HI PLUS

VISCOSIFIER

Product Description

N-VIS® HI PLUS viscosifier is a mixed-metal hydroxide complex that increases the yield of AQUAGEL GOLD SEAL® viscosifier. N-VIS HI PLUS viscosifier is only suitable for use in freshwater in conjunction with Bentonite viscosifiers. Depending on the quality of the Bentonite, N-VIS HI PLUS viscosifier is used at a rate of approximately 10-12 : 1 ppb of Bentonite to N-VIS HI PLUS viscosifier. It is used in the MAXDRIL-N® fluid system where it effectively reduces the amount of AQUAGEL GOLD SEAL viscosifier needed to provide hole-cleaning capabilities. N-VIS HI PLUS viscosifier is also valuable for use in milling operations where local high fluid temperatures can break down polymer viscosifiers and Bentonite extenders. Compared to N-VIS HI viscosifier, N-VIS HI PLUS viscosifier typically gives improved low shear rheology performance.

Applications/Functions

- Helps maintain excellent hole-cleaning during milling operations
- Helps remove large cuttings or formation pieces from drilling rubble or fractured zones
- Can be formulated in freshwater, seawater, sodium chloride brine (up to 20%) and Calcium chloride brine (Up to 10%)

Advantages

- Helps provide high yield points and high low shear rheological properties
- Helps provide equivalent shale stability to mixed metal silicate

Typical Properties

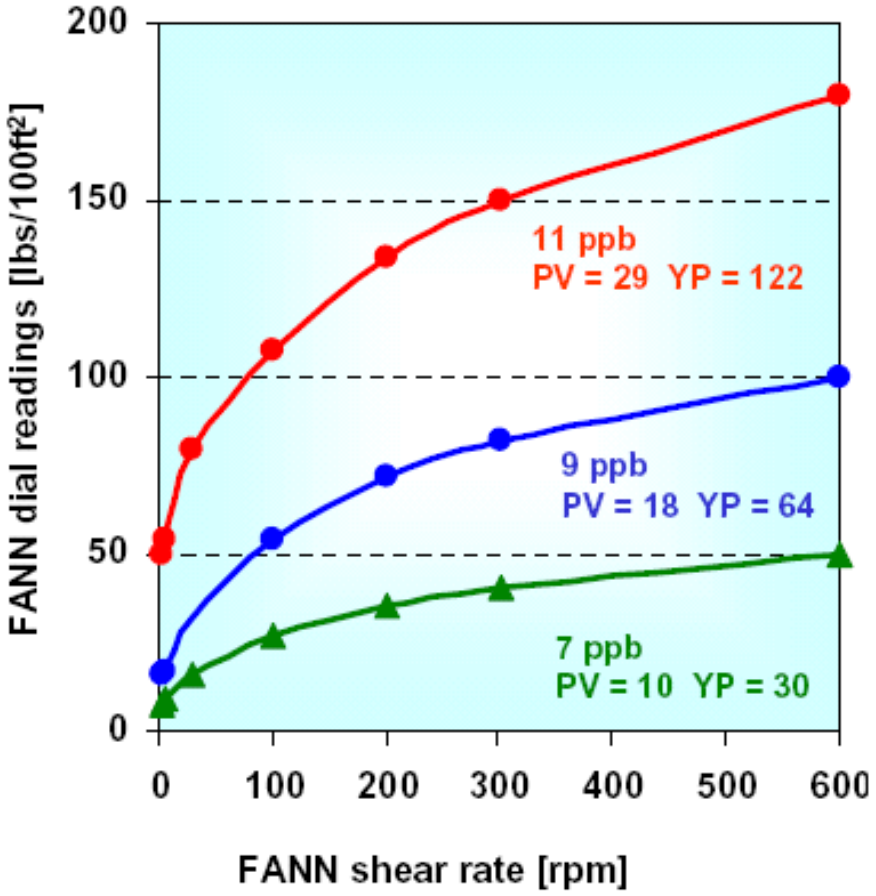
- Appearance: Free flowing off-white powder

Recommended Treatment

Add 0.9 lb/bbl (2.6 kg/m³) to a fluid containing 9 lb/bbl (25.7 kg/m³) pre-hydrated AQUAGEL GOLD SEAL viscosifier. Note that N-VIS HI PLUS viscosifer should not be used with lower quality treated bentonites. For optimum results the pH should be raised using sodium hydroxide to 10 – 11. Lime or BARABUF® pH stabilizer should not be used for pH adjustment. Do not treat fluids containing N-VIS HI PLUS viscosifier with anionic polymers as these will destroy the viscosity. Build fluid in freshwater and then add any brine salts required.

Packaging

N-VIS HI PLUS viscosifier is packaged in 25-lb (11.3-kg) sacks.



N-VIS® L™

VISCOSIFIER

Product Description

N-VIS® L™ viscosifier is a premium quality, clarified Xanthan gum polymer dispersed in a liquid carrier. It is used in DRIL-N® reservoir drill-in fluids to provide solids suspensions and hole cleaning capabilities. Very little shear is required to disperse N-VIS L viscosifier in freshwater, seawater or monovalent brines and should be used when high shear is unavailable, or fast dispersion is required. It can be used up to 250°F (120°C).

Applications/Functions

- Drilling (including horizontal drilling, drill-in fluids, under-reaming, and coiled tubing operations)
- Gravel packing
- Well control
- Sand-washing

Note: The unique suspension properties of N-VIS L viscosifier allow the design of bentonite-free systems.

Advantages

- Helps provide excellent hole cleaning and transport properties
- Friction reducer
- Easy to mix
- Can provide excellent suspension
- Helps minimize formation damage

Typical Properties

- Appearance: Liquid
- Specific Gravity: 1.1

Recommended Treatment

Add 0.3 to 3 quarts/bbl (0.28-2.8 l/bbl) to drilling fluids.

Note: High salt content or cold fluid temperatures can slow N-VIS L viscosifier hydration. Allow more time for complete hydration in these situations.

Packaging

N-VIS L viscosifier is packaged in 5-gal (18.9-l) pails containing 47-lb (21.36-kg).

N-VIS® P PLUS™

VISCOSIFIER

Product Description

N-VIS® P PLUS™ viscosifier is a blend of polymers used to provide viscosity and filtration control in water-based DRIL-N® reservoir drill-in fluids. Together with BARACARB® or BARAPLUG® bridging agents, it can build drill-in fluids that afford high levels of protection of the reservoir formation while providing excellent cuttings transport capabilities. N-VIS P PLUS viscosifier can be used in all brines up to 11.8 lb/gal (1.32 SG) and up to 250°F (120°C).

Applications/Functions

- N-VIS P PLUS viscosifier is designed for application in drilling, completion, and workover operations, helps provide a shear thinning fluid viscosity at high rates of shear, an elevated solution viscosity under static conditions and superior filtration control.
- N-VIS P PLUS viscosifier when used with specially sized bridging/weighting particles, can reduce whole fluid and filtrate invasion into the productive zone and thereby minimize internal formation damage. Fluid compositions mixed with N-VIS P PLUS viscosifier can be used for the following applications:
  - Drilling into pay zone
  - Underreaming
  - Milling
  - Washing sand

Advantages

- Applicable in sea water, potassium chloride, sodium chloride, and sodium bromide solutions.

Note: Suitable composition can also be formulated in calcium chloride with brine densities up to 11.8 lb/gal (1.32 SG).

- Effective in well control applications when properly formulated because it forms a thin, ultra low permeable, readily removable filter cake that prevents solids and fluid invasion into producing formations.
- Polymer synergism helps provide thermally stable fluid rheological properties with improved suspension at downhole temperatures up to 250°F (120°C) with the addition of a pH buffer.

Typical Properties

Appearance:	Free-flowing white powder
Solubility:	Water Soluble

Recommended Treatment

Add 1.0-7.0 lb/bbl (2.9-20 kg/m³).

Packaging

N-VIS P PLUS viscosifier is packaged in 50-lb (22.7-kg) sacks.

OMC®

THINNER

Product Description

OMC® thinner is used to reduce rheology in oil-based drilling fluids that have been treated with organophilic compounds such as GELTONE® viscosifiers or DURATONE® filtration control additive. OMC thinner can effectively reduce the yield point and gel strengths in these fluids. OMC thinner is suitable for INVERMUL® diesel-based drilling fluids and ENVIROMUL™ drilling fluids but should not be used in high performance clay-free drilling fluids.

Applications/Functions

OMC thinner can be used to reduce the yield point and gel strengths of oil-based drilling fluids

Advantages

- Effective in small concentrations
- Can be added directly to the system

Typical Properties

- Appearance: Black liquid
- Specific Gravity: 0.976

Recommended Treatment

Add 0.25-1.50 lb/bbl (0.71-4.28 kg/m³) of OMC thinner directly to the system.

Packaging

OMC thinner is packaged in 15-gal (56.8-l) pails, 55-gal (208-l) drums and in bulk.

OMC® 3™

THINNER

Product Description

OMC® 3™ thinner is used to lower the rheological properties of oil-based drilling fluids that contain organophilic compounds or large amounts of drill solids. OMC 3 thinner works effectively in most oil-based drilling fluids. OMC 3 thinner is environmentally more responsible than OMC 2 thinner.

Applications/Functions

OMC 3 thinner can be used to reduce the yield point and gel strengths of non-aqueous drilling fluid systems

Advantages

- Extremely effective in small concentrations
- Can be added directly to the system without high shear mixing

Typical Properties

- Appearance: Brown liquid
- Specific Gravity: 0.9
- Flash point: > 212°F (> 100°C)
- Pour point: < 14°F (< -10°C)

Recommended Treatment

Add 0.1-0.5 lb/bbl (0.29-1.43 kg/m³) of OMC 3 thinner directly to the system and as needed for rheological modification. Pilot test and hot roll determined additions to avoid potential over treatment.

Packaging

OMC 3 thinner is packaged in 55.1-lb (25-kg) pails and 430-lb (195-Kg) drums.

PAC™

FILTRATION CONTROL ADDITIVE

Product Description

PAC™ filtration control additive can be used in most water-based drilling fluids and is effective at low concentrations. It can provide secondary viscosity and is suitable for use in fresh water, sea-water, and brines up to 300°F (149°C).

Applications/Functions

- Helps control filtration rates
- Helps provide supplementary viscosity in fresh water, sea water, and brine-based fluids

Advantages

- Effective in fresh water, salt water, and brine-based drilling fluids
- Effective in small concentrations for API and HPHT filtration control
- Effective in moderate to high pH systems
- Non-toxic

Typical Properties

Appearance:	White or tan powder
Particle Size:	70% minimum through US #30 sieve

Recommended Treatment

Add 0.5-2.5 lb/bbl (1.43-7.13 kg/m³) of PAC filtration control additive slowly through the hopper.

Packaging

PAC filtration control additive is packaged in 50-lb (22.7-kg) and 25-kg (55.1-lb) sacks.

PAC-L™

FILTRATION CONTROL ADDITIVE

Product Description

PAC-L™ filtration control additive is used in most water-based drilling fluids including fresh water, sea-water, and brine up to 300°F (149°C). PAC-L filtration control additive has a very low impact on fluid rheology, is non-toxic and does not require a biocide. PAC-L filtration control additive exceeds the European specifications for low viscosity polyanionic .

Applications/Functions

Helps control filtration rates without significantly increasing fluid viscosity

Advantages

- Effective in fresh water, salt water, and brine-based drilling fluids
- Effective in small concentrations for filtration control
- Is stable at temperatures up to 300°F (149°C)
- Effective in moderate to high pH systems
- Does not require a bactericide
- Non-toxic

Typical Properties

Appearance:	White or tan powder
pH, (1% aqueous solution):	7.75
Bulk density:	40 – 55lb/ft³ (641 – 881kg/m³)

Recommended Treatment

Add 0.5-3.0 lb/bbl (1.43-8.56 kg/m³) of PAC-L filtration control additive slowly through the hopper.

Packaging

PAC-L filtration control additive is packaged in 50-lb (22.7-kg), and 55.1-lb (25-kg) sacks.

PAC-R™

FILTRATION CONTROL ADDITIVE

Product Description

PAC-R™ filtration control additive is used in most water-based drilling fluids, can provide secondary viscosity and is effective at low concentrations. It is suitable for use in fresh water, sea-water, and brine up to 300°F (149°C). PAC-R is non-toxic and does not require a biocide. PAC-R filtration control additive exceeds the European specifications for low viscosity polyanionic cellulose .

Applications/Functions

- Helps control filtration rates
- Helps provide supplementary viscosity in fresh water, sea water, and brine-based fluids

Advantages

- Effective in fresh water, salt water, and brine-based drilling fluids
- Effective in small concentrations for filtration control
- Is stable at temperatures up to 300°F (149°C)
- Effective in moderate to high pH systems
- Does not require a bactericide
- Non-toxic

Typical Properties

Appearance:	White or tan powder
pH, (1% aqueous solution):	8
Bulk density:	40 – 55lb/ft³ (641 – 881kg/m³)

Recommended Treatment

Add 0.5-2.0 lb/bbl (1.43-5.71 kg/m³) of PAC-R filtration control additive slowly through the hopper.

Packaging

PAC-R filtration control additive is packaged in 50-lb (22.7-kg), and 55.1-lb (25-kg) sacks.

PAC-RE™

FILTRATION CONTROL ADDITIVE

Product Description

PAC-RE™ filtration control additive is used in most water-based drilling fluids, can provide secondary viscosity and is effective at low concentrations. It is suitable for use in fresh water, sea-water, and brine up to 300°F (149°C). PAC-RE is non-toxic and does not require a biocide. PAC-RE filtration control additive exceeds the European specifications for low viscosity polyanionic cellulose.

Applications/Functions

- Helps control filtration rates
- Helps provide supplementary viscosity in fresh water, sea water, and brine-based fluids

Advantages

- Effective in fresh water, salt water, and brine-based drilling fluids
- Effective in small concentrations for filtration control
- Is stable at temperatures up to 300°F (149°C)
- Effective in moderate to high pH systems
- Does not require a bactericide
- Non-toxic

Typical Properties

Appearance:	White or tan powder
pH, (1% aqueous solution):	8
Bulk density:	40 – 55lb/ft³ (641 – 881kg/m³)

Recommended Treatment

Add 0.5-2.0 lb/bbl (1.43-5.71 kg/m³) of PAC-RE filtration control additive slowly through the hopper.

Packaging

PAC-RE filtration control additive is packaged in 50-lb (22.7-kg), and 55.1-lb (25-kg) sacks.

PERFORMATROL®

SHALE STABILIZER

Product Description

PERFORMATROL® shale stabilizer is a high molecular weight polymer that stabilizes reactive clays and shales by inhibiting the uptake of water and mitigating their swelling, sticking and dispersion tendencies. PERFORMATROL shale stabilizer encapsulates cuttings and can flocculate clay particles to aid their removal by solids control equipment. PERFORMATROL shale stabilizer is effective in freshwater or monovalent brines, is shear thinning, provides lubricity and has a low environmental toxicity. PERFORMATROL shale stabilizer is stable to 275°F (135°C) without thermal stabilization but may achieve higher temperature stability with the use of oxygen scavengers.

Applications/Functions

- Encapsulates drill cuttings
- Prevents accretion of sticky clay cuttings
- Helps flocculate dispersed clays and other colloidal particles

Advantages

- Highly effective in potassium brine-based systems below salt saturation
- Minimizes uptake of drill solids and accretion of reactive shales
- Stabilizes the wellbore, minimizing washout and maximizing hole cleaning
- Non-hazardous to rig personnel when used as directed

Typical Properties

Appearance:	Off-white liquid
Specific gravity:	1.03 g/ml

Recommended Treatment

Typical concentrations of 3-4% v/v are used for fluids in the 9-14 lb/gal (1.08-1.68 sg) range. High levels of product and solids may contribute to increased fluid viscosity and faster dehydration of the system. For best results, maintain fluid pH under 10 and make regular water or premix additions to replace water lost to dehydration.

Packaging

PERFORMATROL shale stabilizer is available in 1000-kg IBC tanks.

PERFORMATROL® ULTRA

SHALE STABILIZER

Product Description

PERFORMATROL® ULTRA shale stabilizer is a high molecular weight dry polymer that stabilizes reactive clays and shale by inhibiting the uptake of water. PERFORMATROL ULTRA shale stabilizer encapsulates cuttings and can flocculate clay particles to aid their removal by solids control equipment. It also assists in preventing accretion of sticky clays on metal surfaces. PERFORMATROL ULTRA shale stabilizer is soluble and effective in freshwater or monovalent brines and reduces transportation requirements when compared with other polymeric shale stabilizers. The polymer is stable to 275°F (135°C) without thermal stabilization yet may achieve higher temperature stability with the use of oxygen scavengers.

Applications/Functions

- Helps inhibit hydration, erosion and sticking of reactive shales
- Encapsulates drill cuttings
- Helps flocculate dispersed clays and other colloidal particles

Advantages

- Extremely concentrated dry polymer works at low concentrations, reducing lifts and storage requirements
- Highly effective in potassium brine-based systems
- Minimal effects on fluid loss control and rheological properties
- Can be used to build chloride-free inhibitive fluid systems for environmentally-sensitive areas

Typical Properties

Appearance:	White-clear crystals
pH (5% wt. solution):	5-9
Density	1.20-1.25 sg

Recommended Treatment

Typical concentrations range from 1.0-2.5 lb/bbl (2.85-7.13 kg/m^3). PERFORMATROL ULTRA should be pre-solubilized by preparing a premix before adding to the active system. Ongoing treatments depend on the reactivity of shales encountered, depletion of product, drilling parameters and solids control capabilities.

Packaging

PERFORMATROL ULTRA shale stabilizer is available in 25-kg lined cardboard drums.

PERFORMUL™

EMULSIFIER

Product Description

PERFORMUL™ emulsifier is a primary emulsifier for ENVIROMUL™ and INNOVERT® oil- based drilling fluid systems. PERFORMUL emulsifier is preferred for use in the Norwegian sector because it is a yellow-rated emulsifier. However, PERFORMUL emulsifier can be used worldwide in a number of different fluids. PERFORMUL emulsifier can be used to prepare invert emulsion fluids with a variety of weighting agents and is particularly beneficial with manganese tetraoxide. PERFORMUL emulsifier can also be used effectively in heavy systems at high temperature to give lower viscosity than traditional emulsifiers.

Applications/Functions

- Stabilizes brine-in-oil emulsions using calcium chloride or calcium bromide brine
- Improves the dispersion character of particles in high-density fluids
- Remains stable at temperatures up to 500°F (260°C)
- Effectively disperses high-density particles in emulsions to alleviate settling

Advantages

- Yellow rated product for North Sea usage
- Effective wetting agent with manganese tetroxide weighting agent
- Imparts reduced viscosity to high-density systems over 16 lb/gal (1.92 SG) relative to conventional emulsifiers

Typical Properties

Appearance:	Yellow to brown liquid
Solubility:	Oil Soluble
Specific Gravity:	1.0
Flash Point:	>212°F (100°C)

Recommended Treatment

- Add 2-6 lb/bbl (5.7-17.1 kg/m^3) PERFORMUL emulsifier in typical invert emulsions fluids.
- Add 4-10 lb/bbl (11.4-28.5 kg/m^3) PERFOR MUL emulsifier in INNOVERT fluids
- For high-density, high temperature applications, use 6-18 lb/bbl (17.1-51.4 kg/m^3) depending on fluid density.

Packaging

PERFOR MUL emulsifier is available in 55-gal (208-L) drums and 1980-lb (900-kg) IBC totes.

POLYAC PLUS™

FILTRATION CONTROL ADDITIVE

Product Description

POLYAC PLUS™ filtration control additive is a synthetic fluid loss polymer used in fresh water, sea water and monovalent brines. It tolerates calcium levels to 400 ppm, although it is recommended that make-up water be treated with sodium carbonate or sodium bicarbonate before use. POLYAC PLUS filtration control additive has a minimal viscosity impact on the fluid, is suitable for use beyond 350°F (177°C), and is not susceptible to bacterial degradation.

Applications/Functions

POLYAC PLUS filtration control additive is used to reduce fluid loss in fresh, brackish or salt water

Advantages

- Stable at temperatures approaching 400°F (205°C)
- Not susceptible to bacterial degradation
- Helps minimize viscosity impact due to low molecular weight polymer
- Helps tolerate calcium contamination up to 400 ppm
- Helps improve cuttings integrity

Typical Properties

Appearance:	White granular powder
Bulk density:	50lb/ft³ (800kg/m³)

Recommended Treatment

- For fresh water fluids, add 0.25-1.0 lb/bbl (0.7-2.9 kg/m³)
- For salt water fluids, add 1.0-3.0 lb/bbl (2.9-8.6 kg/m³).

Packaging

POLYAC PLUS filtration control agent is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks.

QUIKSEAL

LOST CIRCULATION MATERIAL

Product Description

QUIKSEAL lost circulation material is a blended engineered product available in three sizes (FINE, MEDIUM, and COARSE) to cover a wide range of applications. QUIKSEAL contains fibrous and granular material and is an excellent all-purpose lost circulation material to seal a variety of fracture sizes and porous formations. QUIKSEAL material requires to be pumped through open-ended drill pipe or a by-pass sub. QUIKSEAL products are compatible with water and non-aqueous based fluids.

Applications/Functions

- Seals and bridges a wide range of fracture sizes and porous formations

Advantages

- Compatible with most water-based and non-aqueous drilling fluids
- Has no adverse effects on rheological and filtration control properties of drilling fluids

Typical Properties

Appearance:	Solid brown flake/granule/fiber blend
Specific gravity:	0.9 – 1.2
QUIKSEAL FINE particle size:	100% passes through US #16 sieve (1,180 microns)
QUIKSEAL MEDIUM particle size:	100% passes through US #6 sieve (3,350 microns)
QUIKSEAL COARSE particle size:	100% passes through US #2 sieve (50,000 microns)

Recommended Treatment

As a remedial pill treatment, add 30 – 50 lb/bbl (85 – 143 kg/m^3).

As background preventative treatment, add 5 – 10 lb/bbl (14 – 29 kg/m^3).

Packaging

QUIKSEAL FINE, MEDIUM, and COARSE are available in 25-kg (55-lb) bags.

QUIK-THIN®

THINNER

Product Description

QUIK-THIN® thinner is a Ferro-Chrome lignosulfonate that helps to control rheological and filtration properties of water-based drilling fluids that contain large amounts of drill solids. QUIK-THIN thinner can be used to maintain dispersed water-based drilling fluids. It works effectively to reduce the effect of contaminants at all pH levels. QUIK-THIN thinner is effective at temperatures up to 350°F (175°C).

Applications/Functions

- Helps reduce the rheological properties of water-base drilling fluids
- Helps prevent high temperature gelation
- Helps minimize adverse effects of mud contamination

Advantages

- Can provide secondary filtration control
- Effective in high calcium environments
- Helps improve filter-cake quality
- Functions in lime, gypsum, salt water and fresh water fluids

Typical Properties

Appearance:	Dark brown powder
Specific Gravity:	1.1
pH, (10% aqueous solution):	3

Recommended Treatment

Add 1-8 lb/bbl (2.9-22.8 kg/m³) of QUIK-THIN thinner.

Note: When pre-hydrated bentonite is added to saltwater systems, add QUIK-THIN thinner o the slurry to help minimize flocculation.

Packaging

QUIK-THIN thinner is packaged in 50-lb (22.7-kg) bags.

ADAPTA® L

FILTRATION CONTROL ADDITIVE

Product Description

ADAPTA® L filtration control agent provides a rapid reduction in the HTHP filtrate of non-aqueous fluid (NAF) systems. This product has been designed to function similarly to other copolymer additives for moderate to standard operating temperatures. ADAPTA L is a liquid polymer suspension, which also may provide secondary viscosity to the fluid system.

Applications/Functions

- Reduces HTHP filtrate at temperatures up to and beyond 300^0F
- Flows through fine mesh shaker screens due to its very small particle size

Advantages

- Effective in small doses
- Can be blended with all types of NAF systems to provide excellent filtration control
- Cold-temperature stable
- Eliminates dust from other dry polymer powdered additives
- Easily added to active fluid systems with no need for additional wetting agents or emulsifiers

Typical Properties

Appearance:	Liquid polymer latex
Solubility:	Oil-dispersible suspension in water
Specific gravity:	0.98 – 1.02

Recommended Treatment

Add 0.5-6.0 lb./bbl. (1.4-17.1 kg/ m^3) of ADAPTA L filtration control agent to fluid systems to achieve the required level of filtration control.

Packaging

ADAPTA L filtration control agent is available in bulk containers, 275-gallon totes (2,310 lbs. net), 55-gallon drums (462 lbs. net), and 5-gallon cans (42 lbs. net).

BARABLOK™

FILTRATION CONTROL ADDITIVE

Product Description

BARABLOK™ filtration control additive is a high melting point gilsonite filtration control additive which can extrude into formation microfractures to form a sealing/plugging & bonding mechanism and which also helps stabilize shales and prevent sloughing. BARABLOK filtration control additive can be used in both water-based and non-aqueous fluid (NAF) systems to control & reduce mud filtrate and create a tough, slick filter cake. BARABLOK filtration control additive can also effectively stabilize brittle shales and reduce washouts in interbedded sand sequences. In water-based drilling fluids, a water wetting agent should be added to promote particle dispersion. BARABLOK filtration control additive is effective at temperatures up to 350°F (177°C). For higher temperature applications replace with BARABLOK™ 400 filtration control additive.

Applications/Functions

- Stabilize shales
- Control HTHP fluid loss
- Reduce fluid invasion through sealing/plugging mechanism

Advantages

- Does not fluoresce
- Helps improve fluid loss control
- Helps provide optimum sealing and filter cake deposition
- Can mix easily with most water-based and NAF systems
- Helps minimize differential sticking

Typical Properties

Appearance:	Black powder
Specific gravity:	1.01
Solubility:	Insoluble in water

Recommended Treatment

1. For water-based systems, add 2-10 lb/bbl (5.7-28.5 kg/m³). Note: Add a suitable wetting agent to preferentially water-wet the particles.

2. For NAF systems, add 5-25 lb/bbl (14.3-71.3 kg/m³).

Packaging

BARABLOK filtration control additive is packaged in 50-lb (22.7- kg) sacks.

BARABLOK™ 400

FILTRATION CONTROL ADDITIVE

Product Description

BARABLOK™ 400 filtration control additive is a high temperature, high melting point uintaite filtration control additive which can extrude into formation microfractures to form a sealing/plugging & bonding mechanism and which also helps stabilize shales and prevent sloughing. BARABLOK 400 filtration control additive can be used in both water-based and non-aqueous fluid (NAF) systems to control & reduce mud filtrate and create a tough, slick filter cake. BARABLOK 400 filtration control additive can effectively stabilize brittle shales and reduce washouts in interbedded sand sequences. To optimize effectiveness in water-based drilling fluids add a suitable wetting agent to preferentially water-wet the particles. This material is effective at temperatures up to 400°F (205°C). For lower temperature applications up to 350°F replace with standard BARABLOK™ filtration control additive.

Applications/Functions

- Stabilize shales
- Control high-temperature fluid loss
- Reduce fluid invasion through sealing/plugging mechanism

Advantages

- Does not fluoresce
- Helps provide optimum sealing and filter cake deposition
- Can mix easily with most water-based and NAF systems
- Helps minimize differential sticking

Typical Properties

Appearance:	Black powder
Specific gravity:	1.06
Solubility:	Insoluble in water, partially soluble in NAF base fluids

Recommended Treatment

1. For water-based systems, add 2-10 lb/bbl (5.7-28.5 kg/m³). Note: Add a suitable wetting agent to preferentially water-wet the bitumen particles: 0.1-0.2 lb/bbl (0.29-0.57 kg/m³).

2. For NAF systems, add 5-25 lb/bbl (14.3-71.3 kg/m³).

Packaging

BARABLOK 400 filtration control additive is packaged in 50-lb (22.7- kg) sacks.

BaraFLC® W-403

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC® W-403 (formerly BDF™-403) filtration control additive is a modified and bacterially stabilized tapioca starch that provides a reduction in filtrate with minimal viscosity buildup in water-based drilling fluids. Through its coating mechanism, BaraFLC W-403 filtration control additive also reduces dispersion of clay particles and stabilizes reactive formations.

Applications/Functions

- Helps lower filtration rates in most water-based drilling fluid systems
- Can improve borehole stability
- Helps flocculate dispersed drill cuttings in clear water drilling

Advantages

- Helps maintain filtration control without detrimental viscosity increase
- Effective with fast drilling, non-dispersed systems
- Can decrease clay dispersion

Typical Properties

Appearance:	Off-white granular powder
Specific Gravity:	1.5

Recommended Treatment

To reduce filtration in drilling fluids, add 2-6 lb/bbl (5.7-17.1 kg/m^3) of BaraFLC W-403 filtration control additive slowly through the hopper.

Note: Small amounts of CELLEX™ filtration control agent or PAC™ viscosity control additives will complement BaraFLC W-403 filtration control additive in fresh and salt water drilling fluids.

- BaraFLC W-403 filtration control additive is incompatible with BARASCAV™ D™ and BARASCAV™ L™ oxygen scavengers.

Packaging

BaraFLC W-403 filtration control additive is packaged in 25-kg (55-lb) bags

BaraFLC® W-690

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC® W-690 (formerly BDF™-690) high temperature filtration control additive is a special starch derivative intended for reducing high-pressure/high-temperature (HPHT) filtrate loss for water-based fluids. It is non-ionic in nature and suitable for fluids containing salts or ion-sensitive additives. BaraFLC W-690 filtration control additive can be used in all water-based fluids, including drilling, completion and work-over fluids. When used in conjunction with a bridging agent such as sized calcium carbonate or sized salt, it provides a thin, pliable, easily removable filter cake.

Applications/Functions

- Used to reduce HPHT fluid loss in any water-based fluid
- Contributes to elevated low shear rate viscosities (LSRV)
- Provides a thin, pliable, easily removed filter cake which minimizes formation damage and facilitates cleanup during completion
- Helps control high temperature filtration loss up to 300°F (149°C)
- Resists calcium contamination over a wide pH range
- Does not require a biocide and does not ferment
- Environmentally safe; no known toxicity or ecological problems
- Cleans up readily following drilling, work over or completion operations

Advantages

- Can be used in most brines including seawater, NaCl, KCl, $CaCl_2$, NaBr and formate salt systems
- Resists calcium contamination over a wide pH range and can be used at temperatures up to 300°F (149°C)

Typical Properties

Appearance:	White powder
Specific Gravity:	1.5

Recommended Treatment

Add 1–7 lb/bbl (2.9–20.0 kg/m^3) of BaraFLC W-690 filtration control additive for most applications.

Packaging

BaraFLC W-690 filtration control additive is packaged in 50 lb (22.7 kg) bags.

BaraFLC®-903

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC®-903 (formerly BDF™-903) filtration control additive is sulfonated asphalt and used primarily in both water-based fluids and standard invert emulsion fluids. BaraFLC-903 filtration control additive helps to form a thin and tough filter cake where the partially soluble particles can effectively bridge micro-fractures. This action prevents shale hydration and sloughing as well as decreases cuttings erosion. BaraFLC-903 filtration control additive is stable to any normal drilling fluid contaminants, operates in a broad range of pH and is proven stable to temperatures over 500°F (260°C).

Applications/Functions

- Filtration control and bridging of micro-fractures
- Reduce high temperature fluid loss

Advantages

- Inhibits dispersion of cuttings
- Reduces shale sloughing
- Exhibits high temperature stability
- Helps form a thin, tough wall cake
- Readily dispersed in water and oil-based fluids

Typical Properties

Appearance:	Dark brown to black free-flowing powder
pH:	9.2
Specific gravity:	0.98 – 1.02

Recommended Treatment

Add 2-8 lb/bbl (5.7-22.8 kg/m^3) of BaraFLC-903 filtration control additive.

Packaging

BaraFLC-903 filtration control additive is packaged in 50-lb (22.7 kg) sacks.

BARAFOS®

THINNER

Product Description

BARAFOS® thinner is a phosphate based product that acts as a thinner and dispersant in freshwater drilling fluids. It is environmentally responsible and contains no heavy metals. BARAFOS thinner is best suited for low temperature, simple gel based systems. BARAFOS thinner does not tolerate saline conditions.

Applications/Functions

- Thins the mud and allows sand and cuttings to settle out
- Minimizes thickening due to anhydrite, gypsum, or cement contamination
- Disperses sticky clays which cause problems such as mud rings and bit balling

Advantages

- Helps thin clay or bentonite slurries quickly
- Effective in small concentrations
- Dissolves rapidly
- Environmentally responsible

Typical Properties

Appearance:	White powder
pH, (1% aqueous solution):	9.7
Bulk Density:	44 lb/ft³ (705 kg/m³)

Recommended Treatment

Add 0.1-0.5 lb/bbl (0.3-1.5 kg/m³) of BARAFOS thinner to fresh water mud slowly at the flow line.

Packaging

BARAFOS thinner is packaged in 50-lb (22.7-kg) sacks.

BARAZAN®

VISCOSIFIER/SUSPENSION AGENT

Product Description

BARAZAN® viscosifier/suspension agent is a powdered Xanthan gum polymer used to viscosify fresh water, seawater and monovalent brines. BARAZAN viscosifier/suspension agent can provide excellent suspension and shear thinning properties. It contains no dispersants or bacterial stabilizers. BARAZAN viscosifier/suspension agent can be used up to 250°F (121°C).

Applications/Functions

- Viscosify fresh water and brine-based fluids used in drilling, milling, under-reaming, and gravel packing operations
- Suspend bridging agents and weighting materials in fresh water and brine systems

Advantages

- Helps provide thixotropic properties and non-Newtonian flow characteristics at low concentrations over a wide salinity range
- Helps reduce friction
- Helps minimize the potential for formation damage

Typical Properties

- Appearance: White powder
- Specific Gravity: 1.5

Recommended Treatment

Add 1-2 lb/bbl (2.85-5.71 kg/m³) of BARAZAN viscosifier/suspension agent or as needed to obtain the desired viscosity and suspension characteristics.

Packaging

BARAZAN viscosifier/suspension agent is packaged in sacks containing 25-lb (11.3-kg) or 55.1-lb (25-kg) net weight.

BAROID® 41

WEIGHTING MATERIAL

Product Description

BAROID® 41 weighting material is ground Barite used to increase the density of drilling fluids to control formation pressures. BAROID 41 weighting material has a specific gravity of 4.1 and can be used to increase the density in oil and water-based drilling fluids up to 20 lb/gal (2.40 SG). BAROID 41 weighting material is more widely available than standard BAROID weighting material. It is chemically inert and does not affect drilling fluid chemical properties.

Applications/Functions

- Helps increase mud density up to 20 lb/gal
- Helps control formation pressures
- Helps stabilize the borehole
- Helps prepare solids-laden plugs for well control applications

Advantages

- The industry standard weighting agent for drilling fluids
- Chemically inert
- Cost-effective weighting agent

Typical Properties

- Appearance: Powder
- Specific Gravity, minimum: 4.1

Recommended Treatment

Use the following weight-up formula to determine the appropriate concentrations to be added to the system.

For 1 bbl starting volume: $X = 1437 (W_f - W_i)/(34.2 - W_f)$
Note the associated volume gain from adding BAROID 41: Volume gain (bbls) = X / 1437

Where:
X = BAROID 41 weight material required, lb/bbl
W_i = Initial mud weight, lb/gal
W_f = Final desired mud weight, lb/gal.

Packaging

BAROID 41 weighting material is packaged in 50-lb (27.7-kg), 100-lb (45.4-kg) and 88.2-lb (40-kg) sacks and in bulk.

BORE-HIB®

SHALE STABILIZER

Product Description

BORE-HIB® shale stabilizer is a liquid blend that can provide inhibition and stabilization of highly reactive clays. It helps to seal pores and micro-fractures in the formation, reduce bit-balling and accretion tendencies, and reduce corrosion. BORE-HIB shale stabilizer has no hydrocarbons or synthetic oils and can be used in applications up to 325°F (163°C). BORE-HIB shale stabilizer is incompatible with divalent ions. If used with sea water, hardness should be treated out prior product addition or dilution.

Applications/Functions

- Used in water-based fluid to help provide inhibition of highly reactive clay and shale formations
- Helps seal pores and micro-fractures in the formation to minimize pore pressure transmission
- Helps reduce bit-balling and accretion tendencies
- Helps to minimize shale swelling and instability

Advantages

- System can provide clay stabilization performance similar to oil-based mud inhibition in a water-based fluid
- No hydrocarbons or synthetic oils
- Can be used in applications up to 325°F (163°C)

Typical Properties

Appearance:	Dark yellow liquid
Specific Gravity:	1.36
pH:	11.9

Recommended Treatment

Add 1.0 - 4.0% by volume of BORE-HIB shale stabilizer per finished barrel of fluid.

Control LGS <7% v/v. Can be used in seawater, fresh water, or monovalent brines. BORE-HIB shale stabilizer can be added while drilling highly reactive clays and stopped while drilling sand packages. BORE-HIB shale stabilizer can be depleted when drilling anhydrite or green cement, and when the fluid is exposed to lime, calcium chloride, or brines with high hardness levels.

Packaging

BORE-HIB shale stabilizer is packaged in 5-gal (18.9-l), 55-gal (208-l) drums and in bulk.

COLDTROL®

THINNER

Product Description

COLDTROL® thinner is used to control the rheological properties of non-aqueous fluid (NAF) systems, with a targeted thinning effect at low temperatures. It helps to prevent low-temperature gelation effects that may occur in drilling fluids at low riser and seabed temperatures in deepwater environments.

Applications/Functions

- Helps reduce the rheological properties of BaraXcel™ clay-free NAF systems in risers and other cold environments, without affecting higher temperature rheological properties

Advantages

- Formulated specifically for deepwater fluids
- Helps reduce low temperature viscosities while maintaining adequate surface and downhole rheological properties
- Can be added directly to the system

Typical Properties

Appearance	Colorless to pale yellow liquid
Specific gravity	0.95

Recommended Treatment

Add 0.3-1.0 lb/bbl (0.9-2.9 kg/m^3), not to exceed 2.0 lb/bbl (5.7 kg/m^3) total concentration.

Packaging

COLDTROL thinner is packaged in 55-gal (208-l) drums, and in bulk.

FACTANT™

EMULSIFIER

Product Description

FACTANT™ emulsifier is a concentrated emulsifier suitable for use in all invert emulsion drilling fluids. FACTANT emulsifier is particularly beneficial in HTHP applications where it often provides secondary filtration control as well as improved emulsion stability. Additions of FACTANT emulsifier after water in-flows helps improve emulsion stability and usually eliminate water in the HTHP filtrate. FACTANT emulsifier is compatible with all non-aqueous base fluids and is effective at low concentrations compared to other additives.

Applications/Functions

- Helps control filtration rates
- Helps provide strong emulsification
- Helps replace traditional emulsifiers and filtration control agents

Advantages

- Helps provide filtration control and emulsion stability at low concentrations
- Compatible with other emulsifiers and wetting agents
- Stable to 425ºF (218ºC)
- Can allow formulation of deep-water fluids with excellent low temperature rheology

Typical Properties

Appearance:	Dark viscous liquid
Specific gravity:	0.96
Pour point:	20 to 22ºF (-5.6 to -6ºC)

Recommended Treatment

Add 1 to 3 lb/bbl (2.9-8.6 kg/m³) FACTANT emulsifier with 2-4 lb/bbl (5.7-11.7 kg/m³) lime for controlling HTHP filtrate.

Add 3 to 4 lb/bbl (3.6-11.4 kg/m³) FACTANT emulsifier with a minimum of 4 lb/bbl (11.4 kg/m³) lime when formulating muds with no other emulsifiers.

Add 1 to 2 lb/bbl (2.9-5.7 kg/m³) LE SUPERMUL™ or DRILTREAT® additives if required as a wetting agent in FACTANT emulsifier muds as solids increase.

Packaging

FACTANT emulsifier is packaged in 5-gal (18.9-l) buckets, 15-gal (56.8-l) drums, 55 gal (208.2-l) drums and bulk.

INVERMUL® NT

EMULSIFIER

Product Description

INVERMUL® NT primary emulsifier is designed for mineral oil, synthetic and paraffin based drilling fluid systems. INVERMUL NT emulsifier helps stabilize emulsions, improve solids wetting, and reduce HPHT filtration. For best results, INVERMUL NT emulsifier requires the addition of lime to produce a calcium soap in-situ.

Applications/Functions

- Helps form stable water-in-oil emulsions
- Helps lower filtration rates
- Helps impart high temperature stability to oil-based fluids

Advantages

- Can be added directly to the system
- Resists electrolyte contamination

Typical Properties

Appearance:	Dark liquid
Flash point, SETA:	156°F (69°C)
Specific gravity:	0.94

Recommended Treatment

1. For normal applications, add 4-12 lb/bbl (11.41-34.24 kg/m³)
2. For high temperatures (350ºF), add 10-25 lb/bbl (28.53-71.33 kg/m³)
3. For relaxed-filtrate systems, add 0.25-4.0 lb/bbl (0.71-11.41 kg/m³)

Note: For every pound of INVERMUL NT emulsifier added to the system, add 0.5 lb/bbl (1.4 kg/m³) of lime.

Packaging

INVERMUL NT emulsifier is packed in 55-gal (208-l), 190-kg drums and in bulk.

BaraBrine® SI

BRINE CONDITIONER

Product Description

BaraBrine® SI scale inhibitor is designed to prevent alkaline earth metal scale deposition in zinc brines. Scale prevention helps permit higher reservoir productivity, minimize production downtime and reduce the risk of localized corrosion.

Applications/Functions

- Designed to work in all brines that contain zinc to help prevent the deposition of scale
- Specifically formulated to work with BaraCor® 450 corrosion inhibitor to prevent corrosion cell formation on unprotected metal exposed to high density brines
- Remains effective long enough to allow a companion product, BaraCor 450 corrosion inhibitor, to fully coat the clean metal surface and helps prevent long term corrosion

Advantages

- Allows clean coating of corrosion inhibitor onto metal surfaces
- Easily added to high density brines
- Low levels of use (0.1% by volume)
- No flocculation or precipitation of scale inhibitor product
- Low pour point allows use in cold climates

Typical Properties

Appearance	Amber liquid	Pour point	10°F / -12°C
Flash point, PMCC	>200°F / 93.3°C	Specific gravity	1.36
pH, (1% solution)	1.5	Kinematic viscosity	20 to 40 cps

Recommended Treatment

BaraBrine SI scale inhibitor 0.1% by volume

Note: Only to be used in conjunction with BaraCor 450 corrosion inhibitor at 0.2-0.4% by weight

Packaging

BaraBrine® SI scale inhibitor is packaged in 55-gal (208-l) drums containing approximately 572-lb (259-kg) net weight.

BaraDefoam™ HP

DEFOAMER

Product Description

BaraDefoam™ HP defoamer is an environmentally responsible, versatile and effective product for most water and brine-based drilling fluids. BaraDefoam HP defoamer is the recommended choice for brine and high salinity fluids over BaraDefoam 1 defoamer.

Applications/Functions

» BaraDefoam HP defoamer can be used as an effective defoamer in most water-based drilling fluids and brine-based systems such as potassium chloride

Advantages

» Environmentally responsible
» Effective at low concentrations

Typical Properties

» Appearance	Clear liquid
» Specific gravity	1.0

Recommended Treatment

Add 0.05-0.30 lb/bbl (0.14-0.86 kg/m³) of BaraDefoam HP defoamer.

Packaging

BaraDefoam HP defoamer is packaged in 5-gal (18.9-l) pails.

BaraBuf®

ALKALINITY, pH, HARDNESS CONTROL

Product Description

BaraBuf® pH buffer is used to provide alkalinity for all water based systems and is compatible with freshwater, brines, and brine polymer systems. BaraBuf pH buffer will dissolve in water and raise the pH of an aqueous system to 10.3. At pH 10.3, no more BaraBuf pH buffer will dissolve. The remaining undissolved product will dissolve if the pH starts to fall and thereby act as a pH buffer. BaraBuf pH buffer can be safer to use than caustic soda.

Applications/Functions

- BaraBuf pH buffer can be used to increase the pH of aqueous systems up to 10.3
- Alternative to lime for treatment of carbon dioxide contamination

Advantages

- Can be safer and more suitable than caustic soda for controlling pH in polymer systems
- Can reduce the potential for hydrolysis of polymers compared to use of caustic soda and lime
- Does not cause precipitates to form when added to calcium or magnesium brines

Typical Properties

Appearance	Fine white powder
Specific gravity	3.58
Specific surface area	86 m^2/g

Recommended Treatment

The normal treatment range of BaraBuf pH buffer is 0.1-2.0 lb/bbl (0.3-5.7 kg/m^3) in most fluids

Note: Up to 3 lb/bbl (8.6 kg/m^3) may be used in drill-in fluids

Packaging

BaraBuf pH buffer is packaged in sacks containing 50-lb (22.7-kg) net weight

BaraCarb®

BRIDGING AGENT

Product Description

BaraCarb® sized-ground marble is an acid soluble engineered sized product that can be used as a bridging agent for fluid loss applications, increasing fluid density for drill-in applications, or as part of a borehole strengthening treatment in conjunction with the WellSET™ service. BaraCarb ground marble is available in seven particle size ranges: 5, 25, 50, 150, 400, 600 and 1200. The numbers reflect the nominal median particle size (d50) of the product. The ground marble has a specific gravity of 2.7 and resists size reduction through attrition while drilling, compared to ground limestone.

Applications/Functions

- BaraCarb 5, 25, and 50 bridging agents can be used to:
  - Increase the density of water-based and oil-based muds
  - Bridge for fluid loss control
- BaraCarb 50, 150, 400, 600, and 1200 bridging agents can be used as bridging agents for:
  - Lost circulation problems
  - Squeeze mixes

Advantages

- Fully soluble in 15% HCl solution (1 gal of HCl dissolves 1.84 lb of BaraCarb agent)
- Helps provide effective bridging

Typical Properties

Appearance	White powder or granules
Specific gravity, approximate	2.7 to 2.78

Recommended Treatment

Use the following formulas to determine the appropriate concentrations to be added.

1. As a weighting agent, add BaraCarb 5, 25, or 50 agents as needed to increase fluid density up to 14 lb/gal (1.68 gm/cm).
   - For 1 bbl starting volume: X = 945 (Wf - Wi)/(22.5 - Wf)
   - For 1 bbl final volume: X = 945 (Wf - Wi)/(22.5 - Wi)

   Where:

   X = BaraCarb agent required, lb/bbl
   Wf = Final desired mud weight, lb/gal
   Wi = Initial mud weight, lb/gal

2. As a bridging agent, add 5-10 lb/bb. (14.26-28.53 kg/m³) of the appropriate grade(s) of BaraCarb agent.

Packaging

BaraCarb® 5, 25, 50, 150, 400, 600 and 1200 are packaged in 50-lb (22.7-kg) sacks and 2,000-lb supersacks.

BaraCor® 95

CORROSION INHIBITOR

Product Description

BaraCor® 95 corrosion inhibitor is amine-based and water soluble. It is effective in drilling fluids, solids-free brines and packer fluids. It can be used in most mono- and divalent brines however a precipitate may be created in calcium brines. BaraCor 95 provides protection for drillpipe, casing and other tubulars in drilling and completion systems. Corrosion protection can be maintained at temperatures up to 375°F (190°C). BaraCor 95 is an antioxidant and can also be used to extend the thermal stability of biopolymers by up to an additional 40°F.

Applications/Functions

- Compatible with a range of water-based drilling fluids and completion fluids
- Secondary function as a thermal extender for biopolymers such as xanthan

Advantages

- Easily dispersed in water
- Effective at low concentrations
- High temperature corrosion control
- Granted the best possible environmental rating

Typical Properties

- Appearance: Clear liquid
- Specific gravity: 1.02
- Flash point: 205°F (96°C)
- pH (1% aqueous): 12

Recommended Treatment

Corrosion can be controlled and limited with the addition of up to 0.4% v/v BaraCor 95. Additions to divalent brines should be limited in order to control precipitation. BaraCor 95 should be used as part of a corrosion control program including biocide and appropriate scavengers. BaraCor 95 should be used at a concentration of 3 - 5 lb/bbl (8.6 - 14.3 kg/m3) when used as a thermal extender in water-based fluids.

Packaging

BaraCor 95 corrosion inhibitor is packaged in 55 gallon (208 l) drums and 5 gallon (19 l) cans.

BaraCor® 100

CORROSION INHIBITOR

Product Description

BaraCor® 100 corrosion inhibitor is a film forming amine that is water soluble and effective for use in solids-free brines and packer fluids. BaraCor 100 corrosion inhibitor is effective up to 400°F (204°C) in monovalent brines and up to 300°F (149°C) in calcium and zinc brines.

Applications/Functions

- Corrosion protection in water-based and brine-based drilling and completion fluids

Advantages

- Effective at low concentrations
- Convenient and easy to use
- Economical

Typical Properties

Appearance	Dark liquid
Flash point, TCC	92°F
pH, (1% aqueous solution)	10.5
Pour point	-10°F / -23°C
Specific gravity	1.0

Recommended Treatment

Treatment recommendations should be based on area histories which indicate a need for an inhibited packer fluid and compatibility test of BaraCor 100 corrosion inhibitor with the packer fluid. Many producing companies require the use of inhibited packer fluids in areas known to have corrosion problems. This is low-cost insurance for production strings.

The suggested treatment for solids-free freshwater or brine packer fluids is 0.5%-1% by volume. BaraCor 100 inhibitor should be mixed with the packer brine after filtration, then spotted in the hole.

Packaging

BaraCor 100 corrosion inhibitor is packaged in 55-gal (208-l) drums containing 462-lb (210-kg) net weight.

BaraCor® 700

CORROSION INHIBITOR

Product Description

BaraCor® 700 corrosion inhibitor is specifically designed to prevent oxygen corrosion in monovalent brines, aerated drilling fluids, and air rich drilling fluid systems such as mist or foam drilling applications. BaraCor 700 corrosion inhibitor helps prevent oxygen pitting and protect drillpipe, casing, and other downhole tubulars. BaraCor 700 corrosion inhibitor can also be used to mitigate hydrogen sulfide and carbon dioxide corrosion.

Applications/Functions

- Helps provide corrosion protection for air, foam, or mist drilling
- Helps protect drillpipe, casing, and stainless steel tubing
- Helps prevent oxygen pitting.

Advantages

- Can be added through a mud hopper or through a chemical barrel
- Does not affect drilling fluid rheological properties
- Can be used in fresh or brine water

Typical Properties

Appearance	Bright yellow liquid
Flash point	107°F
Flash point	42°C
pH	7.4
Specific gravity	1.15

Recommended Treatment

Add 0.5-1.5 lb/bbl (1.4-4.3 kg/m³) of BaraCor 700 corrosion inhibitor directly to the system.

Note: Residual levels of BaraCor 700 corrosion inhibitor in the filtrate should be monitored and maintained at 250-850 ppm.

Packaging

BaraCor 700 corrosion inhibitor is packaged in 5-gal (18.9-l) pails and 55-gal (208-l) drums.

STARCIDE™

BIOCIDE

Product Description

STARCIDE™ biocide is suitable for use in water-based drilling and packer fluids, is compatible with all brine types and is effective against bacteria, moulds and yeasts. STARCIDE biocide is not registered under FIFRA and should not be imported, used or distributed in the USA. STARCIDE biocide may be used with OXYGON™ scavenger, but is not compatible with sulphite and bisulfite based scavengers.

Applications/Functions

- Drilling fluids
- Packer fluids
- Waste water treatment
- Use biocides safely. Always read the label and product information before use.

Advantages

- Compatible with a range of water-based drilling fluids
- Completely soluble in water
- Effective in small concentrations

Typical Properties

Appearance	Colorless to pale yellow liquid
Specific gravity	1.05
Flash point	>100°C (>212°F)

Recommended Treatment

For water-based drilling fluids, add 0.3-1.4 kg/m3 (0.1-0.5 lb/bbl) of STARCIDE directly to the circulating system. Microbial growth is prevented by regular additions of STARCIDE. For brines, add 1.0-1.44 kg/m3 (0.35-0.5 lb/bbl) of STARCIDE directly to the circulating system.

NOTE: For hazard instructions and safety information, please refer to the safety data sheet (SDS).

Packaging

STARCIDE biocide is packaged in 25 kg (55 lb) pails and in 1000 kg (2204 lb) IBCs.

BaraFLC® IE-513

FILTRATION CONTROL ADDITIVE

Product Description

BaraFLC® IE-513 (formerly BDF™-513) filtration control additive is a cross-linked polymer that provides filtration control in non-aqueous systems. It also provides secondary viscosity and is suitable for use in fluids designed for deepwater application. BaraFLC IE-513 filtration control additive is best suited for low solvency base oils. BaraFLC IE-513 filtration control additive is recommended as the primary filtration control agent for our our BaraXcel™ and BaraECD® organophilic clay free fluids.

Applications/Functions

- Provides fluid loss control for invert emulsion and all oil fluid systems in temperature ranges to over 400°F (205°C)
- Faster yield than ADAPTA® filtration control agent in low solvency base oils
- Can provide secondary viscosity

Advantages

- Is an extremely effective HTHP filtrate reducer in low concentrations
- Can be used in all organophilic clay free drilling fluids
- Can be used with other filtration control products
- Easily mixed in dry form through the hopper with rapid results
- Allows formulation of deep water and extended reach fluids with excellent low temperature tolerance

Typical Properties

Appearance	Off-white solid powder
Specific gravity	1.03
Solubility	Oil swellable/dispersible

Recommended Treatment

1. Add 1.0-4.0 lb/bbl (2.9-11.4 kg/m³) for HTHP applications up to 350°F (177°C)

2. Add 4.0-6.0 lb/bbl (11.4-17 kg.m³) for HTHP application above 350°F (177°C), depending on the required HTHP filtrate.

Packaging

BaraFLC IE-513 filtration control agent is available in 55-lb (25-kg) bags.

BaraVis® IE-489

RHEOLOGY MODIFIER

Product Description

BaraVis® IE-489 (formerly BDF™-489) Rheology Modifier is a solid organic-based product that can increase the low shear rheology and Tau 0 values in BaraXcel™ and BaraECD® high-performance non-aqueous fluids.. This product can be used as a standalone product or in conjunction with RHEMOD™ L viscosifier and TAU-MOD® viscosifier. This product is particularly effective for non-weighted and low density fluids.

Applications/Functions

- Increases low shear rheology and Tau 0 in all oil-based systems
- Effective in High-Performance IEF fluids that do not use organophilic clays

Advantages

- Increases low shear rheology without significant contribution to Plastic Viscosity (PV)
- Is not a clay-based material
- Is oil soluble and will not increase solids or particulate loading of the drilling fluid
- Environmentally friendly
- Can be used with all non-aqueous fluids

Typical Properties

Appearance	White / Off White solid
Flash Point	>302°F (150°C)
Solubility	Oil Soluble

Recommended Treatment

Add 1-12 lb/bbl (2.9-34.2 kg/m^3) of BaraVis IE-489 to the active mud system. Most likely treatment levels of 1-6 lb/bbl (2.9-17.1 kg/m^3) should be effective. For maximum rheology gain, combine with 2-3 lb/bbl (5.7-8.6 kg/m^3) of RHEMOD L.

Packaging

BaraVis IE-489 rheology modifier is available in 25 kg bags.

BaraXcel™ 4 BASE

BASE FLUID

Product Description

BaraXcel™ 4 BASE fluid is 100% isomerized olefin-based fluid which is designed to have acceptable environmental compliance for the Gulf of Mexico standards that allow cuttings discharge. BaraXcel 4 base fluid is used to formulate the BaraXcel fluid system that can be used in most drilling environments, particularly deep water, and is stable beyond 475ºF (246ºC).

Applications/Functions

- Synthetic base oil used in formulating BaraXcel drilling fluid system
- Used for organoclay-free high performance fluids
- Suitable for use beyond 475ºF (246ºC)

Advantages

- Good environmental profile, allows for cutting discharge in GOM applications
- Excellent low temperature rheology and hole cleaning properties can be obtained
- Can be used at higher temperatures than BaraXcel 5 base fluid

Typical Properties

Specific gravity	0.78 (70°F / 21°C)
Flash point	>266°F (>130°C)
Pour point	<-10°F (<-23.3°C)

Recommended Treatment

Add BaraXcel 4 base fluid as needed to build the fluid system or maintain the desired oil to water ratio.

Packaging

BaraXcel 4 base fluid is packaged in 42-gal (159-l) drums and in bulk.

BaraXcel™ 5 BASE

BASE FLUID

Product Description

BaraXcel™ 5 BASE fluid is an ester/internal olefin blend created to have the highest level of environmental performance along with superior lubricity and rheological properties in the BaraXcel high-performance drilling fluid system. The BaraXcel 5 BASE oil can be used in applications up to 300°F (149°C). Use of BaraXcel drilling fluids allows for cutting discharge in Gulf of Mexico (GOM) applications.

Applications/Functions

- Synthetic base oil used in formulating BaraXcel drilling fluid
- Used for clay-free high performance fluids
- Suitable for applications up to 300°F (149°C)

Advantages

- Excellent environmental profile, allows for cutting discharge in GOM applications
- Highly lubricious, with the lowest friction factors of all base fluids tested
- Excellent low temperature rheology and hole cleaning properties can be obtained

Typical Properties

Specific Gravity	0.82 (70°F / 21°C)
Flash point	>250°F (>121°C)
Pour point	< 20°F (<-6.7°C)

Recommended Treatment

Add BaraXcel 5 BASE fluid as needed to build the fluid system or maintain the desired oil to water ratio.

Packaging

BaraXcel 5 BASE fluid is packaged in 42-gal (159-l) drums and in bulk.

FORTI-MUL®

EMULSIFIER

Product Description

FORTI-MUL® emulsifier is the primary emulsifier and oil-wetting agent for application in diesel-based BaraXcel™ drilling fluid systems. When FORTI-MUL emulsifier is used with RHEMOD™ L viscosifier and ADAPTA® L filtrate reducer, it aids in producing a stable invert emulsion system with low filtration rates.

Applications/Functions

- Fragile gel properties
- Promote oil-wetting in invert emulsion systems
- Improve electrical stability measurements
- Reduce flow properties of invert emulsions

Advantages

- Effective at low concentrations
- Can be added directly to the system
- Thermally stable at temperatures greater than 500°F (260°C)
- Compatible with other oil-based mud additives

Typical Properties

Appearance	Thick dark liquid
Flash point, PMCC	178°F (81°C)
Specific gravity	0.95

Recommended Treatment

For BaraXcel fluid systems, add 6.0 to 12.0 lb/bbl (17.1 – 34.2 kg/m³) directly into the system.

Packaging

FORTI-MUL emulsifier is packaged in 55-gal (208-l) drums and in tote tanks or in bulk.

GELTONE® II

VISCOSIFIER

Product Description

GELTONE® II viscosifier is an organophilic clay used to impart viscosity and suspension properties to oil-based drilling fluids. GELTONE II viscosifier typically yields faster than GELTONE V viscosifier but will reach the same final viscosity. GELTONE II viscosifier should not be used in high performance clay-free oil based drilling fluids.

Applications/Functions

- Viscosify any oil-based drilling fluid – clay system oil-based mud
- Helps improve hole cleaning during drilling and workover operations
- Gel oil muds for long-term suspension of weighting agents in packer fluids and casing packs

Advantages

- Stable at temperatures approaching 350°F (176°C)
- Aids in filtration control

Typical Properties

Appearance	Gray-tan powder
Specific gravity	1.7

Recommended Treatment

Add 2-15 lb/bbl (5.71-42.80 kg/m³) of GELTONE II viscosifier slowly through the hopper.

Note: Decrease yielding time by adding a small stream of water through the hopper at the same time.

Packaging

GELTONE II viscosifier is packaged in 50-lb (22.7-kg) sacks.

OMC® 42™

THINNER

Product Description

OMC® 42™ thinner is used to reduce the rheological properties of all oil-based drilling fluids that contain large amounts of drill solids. It is suitable for use in BaraXcel™ high performance oil based drilling fluids and does not affect the emulsion chemistry of these fluids.

Applications/Functions

OMC 42 thinner can be used to reduce the yield point and gel strengths of non-aqueous drilling fluid systems

Advantages

- Effective in small concentrations
- Can be added directly to the system

Typical Properties

» Appearance	Brown liquid
» Specific gravity	0.92

Recommended Treatment

Add 0.25-1.50 lb/bbl (0.71-4.28 kg/m³) of OMC 42 thinner directly to the system. Perform pilot testing to ensure excessive thinning does not occur.

Packaging

OMC 42 thinner is packaged in 15-gal (56.8-l) pails, 55-gal (208-l) drums and in bulk.

BaraBlend®-665

LOST CIRCULATION MATERIAL

Product Description

BaraBlend®-665 premium granular, high fluid loss lost circulation material (LCM), containing fine-sized reticulated foam, can be used in fresh or salt water in any formation, but not intended for reservoir applications. This proprietary, engineered, composite solution is designed to rapidly seal fractures up to at least 3,000 microns. BaraBlend-665 LCM is designed to be used as a remedial LCM treatment, but should never be added to drilling fluid. Its unique composition in a single sack minimizes drilling non-productive time, while being able to be pumped through typical bottom-hole assemblies (BHAs) using a specially designed pump procedure.

Applications/Functions

- Applicable for when drilling into partial to severe loss-prone areas in any formation type (permeable or impermeable)
- Only hesitation squeeze applications – to facilitate high fluid loss of slurry

Advantages

- Engineered, composite solution that functions Independent of fracture size or loss zone location
- Increased rig-floor efficiency:
  - Reduces footprint on rig floor
  - Lowers costs associated with excess inventory and space
  - Minimizes time to cut and mix sacks from different pallets
  - Helps reduce HSE incidents and waste with less sacks to lift and cut

Typical Properties

Appearance	White, grey or lightly red particles and fine-sized reticulated foam (black)
Solubility	At least 33% acid soluble
Specific gravity	2.3-2.7

Recommended Treatment

For sealing fissures and holes up to 3,000 microns, typical concentrations should be around 80-100 lb/bbl. Please consult the Standard Field Application Procedure for BaraBlend-665 LCM for product concentrations at various pill densities. Can seal upto 40,000 micron if supplemented with BaraLock 666 M & C.

Packaging

BaraBlend-665 LCM is packaged in 50 lb (22.7 kg) sacks.

BaraPlug®

BRIDGING AGENT

Product Description

BaraPlug® bridging agent is a series of specially sized and treated salts that has a wide distribution of particle sizes suitable for bridging and sealing productive formations. BaraPlug bridging agent is available in three different size grades: 20, 50 and 6/300. BaraPlug bridging agent is used to temporarily seal lost circulation zones having high permeability and can be easily removed from producing formations with fresh or unsaturated salt water.

Applications/Functions

- Temporarily seal lost circulation zones having high permeability
- Applicable when larger particle size bridging salts are needed
- Helps increase the density of saturated brines

Advantages

- Soluble in fresh or unsaturated water
- Easily cleaned and removed from producing formations
- Specially sized salt for bridging a range of pore sizes

Typical Properties

Appearance	Free-flowing crystals
Density	2.189g/cm^3

Recommended Treatment

Add BaraPlug bridging agent as needed to a SOLUDRIL-N™ system.

Packaging

BaraPlug bridging agent is packaged in 50-lb (22.7-kg) sacks.

BARO-SEAL®

LOST CIRCULATION MATERIAL

Product Description

BARO-SEAL® lost circulation material is a combination of fibers, granules, and flakes sized to plug large natural fractures. It can be used in both water-based and oil-based fluids. BARO-SEAL is furnished in two size ranges: medium and coarse.

Applications/Functions

- Helps seal permeable zones
- Helps reduce loss of whole mud

Advantages

- Can mix easily with standard rig equipment and can be pumped with the rig pumps
- Can be used with most fluids
- Will not plug conventional drilling equipment

Typical Properties

Appearance	Brown, white, and gray particles and fibers
Density	1.1

Recommended Treatment

- As a slug treatment, add 30-50 lb/bbl (85.59-142.65 kg/m^3).
- As a preventative treatment, add 5-20 lb/bbl (14.27-57.06 kg/m^3).

Notes: BARO-SEAL lost circulation material can be screened from the active drilling fluid system by shale shakers or mud cleaner. These pieces of equipment should be bypassed if BARO-SEAL lost circulation material is to be maintained as a preventative treatment.

When BARO-SEAL lost circulation material is used in an oil-based mud, a secondary emulsifier or wetting agent can be used to prevent water wetting of its solids. This will maintain the emulsion stability of the fluid. It is recommended to stress test the fluid to a higher temperature (100°F) to determine if a secondary emulsifier or wetting agent is needed.

Downhole tools with small tolerances may become plugged.

Packaging

BARO-SEAL lost circulation material medium and coarse grades are packaged in 40-lb (18.1-kg) sacks.

BAROFIBRE® O

LOST CIRCULATION MATERIAL

Product Description

BAROFIBRE® O lost circulation material is a natural cellulose material with an oil that renders it hydrophobic, or conversely, oleophylic. Initially touted for the ability to be used in an oil base drilling fluids without increasing emulsifier demand or decreasing the electrical stability, it has been determined to be equally effective in a water base fluids. One significant aspect is the ability it exhibits to plug a wide range of pore sizes, with effective results on 10, 25, 35 and 190 micron ceramic disks in a PPA test at 1000 psi differential pressure. It is provided in three particle size ranges, F, M and L.

Applications/Functions

- Helps reduce wallcake permeability and seepage loss
- Helps seal and bridge sands and microfractures
- May lubricate the wellbore by creating a more lubricious filter cake

Advantages

- Has minimal adverse effects on rheological properties of the drilling fluids
- Compatible with most water-based and oil-based muds
- Will not plug drilling equipment
- Biodegradable and nontoxic
- Has no adverse effects on rheological and filtration control properties of the drilling fluids

Typical Properties

Appearance	Reddish dark brown to black powdered fibers
Bulk density	23 lb/ft³
pH, (1% solution)	4.9
D50, (+/- microns)	80 microns

Recommended Treatment

- As a preventive treatment, add 2-15 lb/bbl (5.7-58.0 kg/m³).
- As a lost circulation remediation treatment, add 20-50 lb/bbl (77.3-193.3 kg/m³).

Note: Water-based fluids treated with BAROFIBRE O lost circulation material should be supplemented with a biocide such as ALDACIDE® G biocide to control potential bacterial contamination. Sweeps could help reduce torque and drag.

Packaging

BAROFIBRE O lost circulation material is packaged in 25-lb (11.3-kg) sacks.

BAROFIBRE®

LOST CIRCULATION MATERIAL

Product Description

BAROFIBRE® lost circulation material is a natural cellulose fiber that can be used effectively in spot pills, sweeps and maintenance treatments with minimal adverse effect on rheology and filtration control properties. The cellulosic material helps decrease the permeability of the wall-cake in all drilling fluid types. BAROFIBRE lost circulation material additions do not interfere with pumping equipment or downhole tools when used in the proper concentration ranges. The material is provided in three size ranges; BAROFIBRE® SF, BAROFIBRE and BAROFIBRE® C lost circulation material. These materials are compatible with water and non-aqueous based fluids.

Applications/Functions

- Helps reduce wallcake permeability and seepage loss
- Helps seal and bridge depleted sands and microfractures

Advantages

- Is compatible with most water-based and oil-based muds
- Has no adverse effects on rheological and filtration control properties of drilling fluids
- Will not plug drilling equipment
- Is biodegradable and nontoxic

Typical Properties

Appearance	Regular: Brown-powdered material
Appearance	Coarse: Granulated material
Bulk density	31lb/ft³
Bulk density	497kg/m³
pH, (1% aqueous solution)	4.9

Recommended Treatment

- As a preventive treatment, add 2-10 lb/bbl (5.7-28.5 kg/m³).
- As a slug treatment, add 30-50 lb/bbl (85.6-142.7 kg/m³).

Note:Water-based fluids treated with BAROFIBRE lost circulation material should be supplemented with a biocide such as ALDACIDE® G biocide to control or eliminate potential bacterial contamination.

Treatments in excess of 20 lb/bbl (57.1 kg/m³) may cause reduction in electrical stability measurements in oil-based systems.

Packaging

BAROFIBRE lost ciruculation material regular is packaged in 25-lb (11.3-kg) sacks. BAROFIBRE lost circulation material coarse additive is packaged in 40-lb (18.1-kg) sacks.

BAROLIFT®

SWEEPING AGENT

Product Description

BAROLIFT® sweeping agent is used to increase the carrying capacity of fluids without significantly altering rheological properties. BAROLIFT sweeping agent is a synthetic fiber and is suitable for use in all fluid types, vertical and horizontal wells, and is an ideal product for use during milling operations.

Applications/Functions

- BAROLIFT sweeping agent is designed to sweep vertical and horizontal wells which aids in carrying capacity
- Can be easily mixed through the mud hopper, in all types of fluids

Advantages

- BAROLIFT sweeping agent can aid in lifting drill cuttings to surface, without altering rheological properties.
- BAROLIFT sweeping agent is an ideal product for lifting metal cuttings, during a milling job, due to its lifting capabilities.
- Helps avoid costly mud-ups when using water or brines

Typical Properties

Appearance	White fibers
Specific gravity	0.9
Softening point	315°F
Softening point	157°C

Recommended Treatment

As a sweep add 0.25 to 0.50 lb/bbl (0.7-1.4 kg/m³)

Note: With mud motor in hole add 0.1 to 0.2 lb/bbl (0.3-0.6 kg/m³)

Packaging

BAROLIFT sweeping agent is packaged in 15-lb (6.8-kg) cartons.

CON DET® E

SHALE STABILIZER

Product Description

CON DET® E shale stabilizer is a liquid surfactant based product that can be used in fresh or salt water and in low-solids drilling fluids. CON DET E shale stabilizer helps reduce the potential for bit balling, helps increase ROP and helps reduce the stickiness of water sensitive cuttings. This product is readily biodegradable and formulated to meet North Sea discharge standards.

Applications/Functions

- Helps increase the drilling rate by improving bit cleaning and release of cuttings from the bit surface
- Helps retard breakup of cuttings in the annulus
- Helps promote settling of cuttings at the surface
- Helps counteract the sticking tendencies of clays and thereby reduce wall-packing, bit-balling, booting-off, and formation mud rings

Advantages

- Helps increase drilling rate with concentrations as low as 1:1000 (0.1% by volume)
- Soluble in water
- Helps reduce reduce the potential for bit balling
- Readily biodegradable

Typical Properties

Appearance	Pale red liquid
Flash Point	149°F (>65°C)
pH (1% aqueous solution)	9.5
Specific gravity	1.05

Recommended Treatment

Add 0.25-1.0 lb/bbl (0.7-2.9 kg/m³) of CON DET E shale stabilizer to help promote bit cleaning and reduce stickiness

Packaging

CON DET® E shale stabilizer is packaged in 20-kg pails, and 200-kg drums

CON DET®

WETTING AGENT

Product Description

CON DET® wetting agent is a blend of water-soluble surfactants that efficiently wets metal surfaces. CON DET wetting agent is often used to clear the drilling bit of balling caused by the adhesion of soft clays and shales. Commonly, CON DET wetting agent is applied in concentrated pills or added neat down the drill-pipe for optimum results.

Applications/Functions

- Helps increase the drilling rate by improving bit cleaning and release of cuttings from the bit surface
- Helps retard breakup of cuttings in the annulus
- Helps promote settling of cuttings at the surface
- Helps counteract the sticking tendencies of clays and thereby reduce wall-packing, bit-balling, booting-off, and formation of mud rings

Advantages

- Helps increase drilling rate with concentrations as low as 1:1000 (0.1% by volume)
- Mixes easily
- Soluble in water
- Does not ferment
- Readily biodegradable

Typical Properties

Appearance	Clear red liquid
Flash Point	210°F (99°C)
pH, (1 % aqueous solution)	9.5
Specific gravity	1.025

Recommended Treatment

Add 0.25-1.0 lb/bbl (0.7-2.9 kg/m³) of CON DET wetting agent to help promote bit cleaning and reduce stickiness.

Packaging

CON DET wetting agent is packaged in 5-gal (18.9-l) pails and 55-gal (208-l) drums.

CRYSTAL-DRIL®

SHALE STABILIZER

Product Description

CRYSTAL-DRIL® shale stabilizer is a synthetic liquid polymer used for both shale inhibition and solids flocculation. CRYSTAL-DRIL shale stabilizer binds strongly to active clay, shale and drill cuttings which helps reduce clay hydration and helps improve drill cutting integrity. CRYSTAL-DRIL shale stabilizer has shown benefits in increasing ROP through bit-balling elimination and drill solid reduction. CRYSTAL-DRIL shale stabilizer works exceptionally well in PDC bit applications, where extended bit runs are expected.

Applications/Functions

- Shale Stabilizer
- Drill Solids flocculent

Advantages

- Promotes borehole stability
- Compatible with most water environments
- Effective at low product concentrations
- Reduces bit-balling and improves ROP
- 50% active polymer concentration

Typical Properties

Form	Liquid
Appearance	Milky, off-white
Flash Point	>200°F
Specific Gravity	1.06
Solubility	Water soluble / dispersible

Recommended Treatment

Add 0.1-2 lb/bbl (0.29-5.7 kg/m3) mixed slowly through the hopper

Packaging

CRYSTAL-DRIL shale stabilizer is available in 5-gal pails (44.2-lbs) and 55-gal drums (486-lbs)

ENVIRO-THIN™

THINNER

Product Description

ENVIRO-THIN™ thinner is a modified iron lignosulfonate that helps to control rheological and filtration properties of water-based drilling fluids that contain large amounts of drill solids. ENVIRO-THIN thinner can be used to maintain all dispersed water-based drilling fluids. It works effectively to reduce the effect of contaminants at a pH of 9.0 and above and is effective at temperatures up to 325°F (160°C). ENVIRO-THIN thinner contains no chrome and is environmentally more responsible than heavy metal containing lignosulfonate thinners.

Applications/Functions

- Helps reduce flow properties in all kinds of water-based drilling fluids
- Helps provide effective control of filtration rates of water-based muds approaching 325°F (160°C)

Advantages

- Chrome-free, low toxicity thinner for environmentally sensitive areas
- Helps provide effective contaminant tolerance against drilled solids, salt, cement, and anhydrite
- Is stable at temperatures approaching 325°F (160°C)
- Effective at low pH ranges (8.0-9.5)

Typical Properties

Appearance	Dark powder
pH, (5% aqueous solution)	3.5

Recommended Treatment

Add 2-6 lb/bbl (5.7-17.1 kg/m^3) of ENVIRO-THIN thinner

Packaging

ENVIRO-THIN thinner is packaged in 50-lb (22.7-kg) sacks.

EZ-MUD® DP

SHALE STABILIZER

Product Description

EZ-MUD® DP shale stabilizer is a high molecular weight, 100% active dry powder polymer used to stabilize reactive clays and shale formations in water based drilling fluids. This product absorbs onto cuttings and clays on the borehole wall, which helps to prevent dispersion. EZ-MUD DP shale stabilizer is also used to provide secondary viscosity and reduce bit-balling. EZ-MUD DP shale stabilizer is suitable for use up to 300°F (149°C) in fresh water, sea water and monovalent brines. High pH environments (> 10.5) can cause hydrolysis, particularly at elevated temperatures, and should be avoided.

Applications/Functions

- Helps stabilize water-sensitive formations
- Helps reduce bit-balling
- Helps increase rheological properties of drilling fluids
- Helps provide mud lubricity in low pressure situations
- Helps flocculate drilled solids when used in low concentrations
- Helps enhance the yield of bentonite clays in low solids drilling systems

Advantages

- Is nonfermenting
- Does not require biocides
- Stable in monovalent salt (NaCl, KCl, etc.) environments
- Effective in small concentrations
- Can be destroyed with oxidizing agents when desired

Typical Properties

Appearance	White powder
pH, (1% aqueous solution)	7
Specific gravity	1.05

Recommended Treatment

Add 0.25-1.5 lb/bbl (0.71-4.3 kg/m³) of EZ-MUD DP shale stabilizer slowly through the hopper.

Packaging

EZ-MUD DP shale stabilizer is packaged in a 14-lb (6.4-kg), 20-lb (9.8-kg) pails, 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks.

EZ-MUD®

SHALE STABILIZER

Product Description

EZ-MUD® shale stabilizer is a synthetic polymer dispersed in a liquid carrier that is used in water based fluids to help stabilize reactive clay and shale formations. This product absorbs onto cuttings and clays on the borehole wall, which helps to prevent dispersion. EZ-MUD shale stabilizer also quickly viscosifies with increased concentrations. This product is readily soluble in fresh, brackish, or monovalent salt waters, and can be used to with clay based viscosifiers or alone to prepare solids-free drilling fluids. EZ-MUD shale stabilizer is suitable for application up to 300°F (149°C). High pH environments (> 10.5) can cause hydrolysis, particularly at elevated temperatures, and should be avoided.

Applications/Functions

- Helps stabilize water-sensitive formations
- Helps reduce bit-balling
- Helps increase rheological properties of drilling fluids
- Helps provide mud lubricity in low pressure situations
- Helps flocculate drilled solids when used in low concentrations
- Helps enhance the yield of bentonite clays in low solids drilling systems

Advantages

- Yields rapidly with minimum shear
- Is nonfermenting
- Does not require biocides
- Stable in monovalent salt (NaCl, KCl, etc.) environments
- Effective in small concentrations
- Can be destroyed with oxidizing agents when desired

Typical Properties

Appearance	Milky-white fluid with minimal syneresis
Flash point, PMCC >	200°F
Flash point, PMCC >	93°C
Specific gravity	1.05

Recommended Treatment

Add 1-4 lb/bbl (2.9-11.4 kg/m^3) of EZ-MUD shale stabilizer slowly through the hopper.

Note: If product has separated due to extended storage, resuspend by shaking vigorously or rolling containers before using

Packaging

EZ-MUD shale stabilizer is packaged in 5-gal (18.9-l), 1-gal (3.8-l) and 6.6 gal (25-l) pails.

GEM™ CP

SHALE STABILIZER

Product Description

GEM™ CP shale stabilizer is a cloud point producing polyglycol that can be used in water-based drilling fluids to help improve lubricity and shale stability. It is recommended for use in potassium and sodium salt based fluids when highly reactive clays are anticipated. GEM CP shale stabilizer also helps to reduce bit-balling, is compatible with most water-based drilling fluids, is unaffected by contaminants, can decrease the HTHP filtration. GEM CP shale stabilizer is environmentally friendly and suitable for use world wide.

Applications/Functions

- Helps stabilize reactive formations
- Helps increase lubricity of the drilling fluid
- Helps reduce bit-balling tendencies
- Helps decrease HTHP filtration

Advantages

- Compatible with most water-based drilling fluids
- Unaffected by contaminants
- Environmentally responsible

Typical Properties

Appearance	Clear colorless liquid
pH, (10% aqueous solution)	6.25
Specific gravity	1.02
Cloud point	See table
Solubility	Water soluble

Recommended Treatment

Add 2-7 percent by volume to the mud system

Packaging

GEM CP shale stabilizer is available in 55-gal (208-l) drums containing 465-lb (211-kg) net weight and in IBC tanks

GEM™ GP

SHALE STABILIZER

Product Description

GEM™ GP shale stabilizer is a polyglycol that can be used in water-based drilling fluids to help improve lubricity and shale stability. It is recommended for use in potassium and sodium salt based fluids when low to medium reactive clays are anticipated. GEM GP shale stabilizer also helps to reduce bit-balling, is compatible with most water-based drilling fluids and is unaffected by contaminants. GEM GP shale stabilizer is environmentally friendly and suitable for use worldwide.

Applications/Functions

- Helps stabilize reactive formations
- Helps increase mud lubricity
- Helps reduce bit-balling tendencies

Advantages

- Compatible with most water-based drilling fluids
- Unaffected by contaminants
- Environmentally responsible

Typical Properties

Appearance	Dark brown liquid
pH	7.8
Specific gravity	1.01
Cloud point	6% (w/w) in 10% KCl: 135F – 165F (57C – 74C)

Recommended Treatment

Add 2-6 percent by volume to the mud system.

Packaging

GEM GP shale stabilizer is available in 55-gal (208-l) drums containing 465-lb (211-kg) net weight and in bulk.

GEM™ GPE

SHALE STABILIZER

Product Description

GEM™ GPE shale stabilizer is a blend of polyglycols that can be used in water-based drilling fluids to help improve shale stability and lubricity. It is recommended for use in potassium and sodium salt based fluids but can be effectively used in fresh water non-dispersed fluids when low to medium reactive clays and shale are anticipated. GEM GPE shale stabilizer does not exhibit cloud point behavior in any fluids up to 210°F (98°C). GEM GPE shale stabilizer also helps to reduce bit-balling, is compatible with most water-based drilling fluids and is unaffected by contaminants. GEM GPE shale stabilizer is environmentally friendly and suitable for use worldwide including severe arctic conditions.

Applications/Functions

- Helps stabilize reactive formations
- Helps improve mud lubricity
- Helps reduce bit-balling tendencies
- Decreases freezing point of drilling or completion fluid

Advantages

- Compatible with most water-based drilling fluids
- Unaffected by contaminants
- Environmentally responsible
- Suitable for use under severe arctic conditions

Typical Properties

Appearance	Colorless to brown liquid
Solubility	Cold Water Soluble
Specific Gravity	1.08 to 1.18
pH	6 to 9

Recommended Treatment

Add 1-6 percent by volume to the mud system

Packaging

GEM GPE shale stabilizer is available in 55-gal (207-l) drums containing 507-lb (230-kg) net weight.

HYDRO-PLUG®

LOST CIRCULATION MATERIAL

Product Description

HYDRO-PLUG® lost circulation material is a combination of products and contains a key component that hydrates and swells to form a compliant treatment. It is a simpler system than one that chemically cross-links, and has minimal changes in reaction rate with temperature. HYDRO-PLUG lost circulation material also contains a combination of resilient graphitic carbon and other sized components. Incorporating the swelling polymer along with engineered combinations of resilient graphitic carbon and other materials creates a hybrid chemical/particulate treatment that is often more effective than a single type of treatment. This product can be mixed and pumped through bits and downhole motors using the rig pumps and can be applied in both low and high permeability formations.

Applications/Functions

- HYDRO-PLUG lost circulation material will work with all types of water-based and oil-based drilling fluids but must be mixed in fresh water. HYDRO-PLUG lost circulation material is ideal for use in deep water operations where synthetic base drilling fluids are in use.

Advantages

- Mix and pump without costly trips
- Quick-acting sealant for vugular, fractured formations and severe loss zones
- Rapid mixing through standard hopper
- One-sack product provides compact storage; each pallet of HYDRO-PLUG lost circulation material makes a 25-bbl pill
- No special equipment is required to place the pill, just the rig pump

Typical Properties

Appearance	Mixture of dark gray to black granules and flakes
Specific gravity	2

Recommended Treatment

For normal treatment, add 45 bbls of freshwater (freshwater only) to a clean pit. Add 80 50-lb bags of HYDRO-PLUG lost circulation material. Do not add CAUSTIC or LIME. Spot the mixture across the loss zone and perform a gentle squeeze (if possible). Do not add directly to active system.

Note: A 90 to 120 minute window is required to mix, pump and squeeze. No special equipment is required to pump the pill. Just use the rig pump.

Packaging

HYDRO-PLUG lost circulation material is packaged in 50-lb (22.7-kg) bags

PLUG-GIT®

LOST CIRCULATION MATERIAL

Product Description

PLUG-GIT® lost circulation material is a family of ground wood fibers that are sized to plug large natural fractures. PLUG-GIT and PLUG-GIT P lost circulation materials are ground cedar fiber. PLUG-GIT P lost circulation material is a pelletized version of PLUG-GIT lost circulation material designed to reduce transport volumes. PLUG-GIT® H lost circulation material is ground hardwood fiber from multiple sources, but is otherwise identical to PLUG-GIT lost circulation material.

Applications/Functions

» PLUG-GIT lost circulation material can be used in porous formations to help reduce and eliminate lost circulation.

Advantages

» Mats and bridges against permeable or fractured zones
» Is compatible with other lost circulation materials
» Does not deteriorate and does not alter the properties of the drilling fluid

Typical Properties

» Appearance	Wood Shavings
» Specific Gravity	1.1 to 1.4
» Solubility	Not Soluble

Recommended Treatment

» As a treatment, add 3-10 lb/bbl (8.6-28.5 kg/m³) of PLUG-GIT lost circulation material through the mixing hopper or directly to the system.
» As a slug treatment, add 20-30 lb/bbl (57.0-85.6 kg/m³).

Packaging

PLUG-GIT and PLUG-GIT H lost circulation materials are packaged in 40-lb (18.1-kg) sacks.
PLUG-GIT P lost circulation material is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks.

BaraLube® W-921

DRILLING LUBRICANT

Product Description

BaraLube® W-921 lubricant is designed to reduce torque and drag while drilling with water-based mud, concentrated brine and produced water drilling systems. BaraLube W-921 is tolerant of high temperatures, extreme pH values and elevated concentrations of chlorides, calcium and ammonia. BaraLube W-921 is formulated for cold weather storage. In addition to a reduction in drill string torque, BaraLube W-921 can decrease the tendencies for bit-balling, stuck pipe and other causes of low ROP. BaraLube W-921 is commonly used in solids-free fluids, but can be added to drilling fluid systems without detrimental effects on rheology and performance.

Applications/Functions

- Water- and brine-based drilling systems
- Reduction of torque and drag
- ROP enhancer

Advantages

- Tolerant of harsh drilling brines
- Stable in high hardness and ammonia concentrations
- Pour point down to -12°F (-24°C)
- Stable up to 350°F (177°C)

Typical Properties

Appearance	Amber liquid
Specific Gravity	0.87
Flash point	136°F (58°C)

Recommended Treatment

BaraLube W-921 is effective at concentrations in the range 2-4% v/v. After initial treatment, periodic additions will maintain the desired concentration and performance.

Packaging

BaraLube W-921 viscosifier is packaged in 10kg drums (22 lb).

RM-63™

RHEOLOGY MODIFIER

Product Description

RM-63™ rheology modifier is used to improve rheological and suspension characteristics of invert emulsion fluids. RM-63 rheology modifier can help to increase low shear rheological properties which improve cuttings transport, particularly in a highly deviated and horizontal wellbores, and helps to reduce barite sag. This product can be used in a wide range of oil/water ratios, and is suitable for use beyond 400°F (204°C).

Applications/Functions

- Helps increase low shear rheological properties
- Helps improve cuttings transport in highly deviated and horizontal wellbores
- Helps reduce barite sag in highly deviated wellbores

Advantages

- Helps provide suspension in a wide range of oil/water ratios
- Can provide a cost-effective alternative to increasing suspension with organophilic clay additions
- Stable at temperatures approaching 400°F (204°C)

Typical Properties

Appearance:	Dark liquid
Flash point:	475°F (246°C)
Specific Gravity:	0.95

Recommended Treatment

Add 0.25-1.5 lb/bbl (0.7-4.2 kg/m³) of RM-63 rheology modifier.

Packaging

RM-63 rheology modifier is packaged in 55-gal (208-l), 190-kg drums and 950-kg IBC tanks.

TAU-MOD®

VISCOSIFIER

Product Description

TAU-MOD® viscosifier is used to improve fluid stability, weight material suspension and hole cleaning capacity in high performance invert emulsion drilling fluids built using organophilic clay-free technology. TAU-MOD viscosifier is composed of elongated inorganic particles that require some shear to achieve full yield. This product provides structure in the emulsion to aid the function of liquid polymeric rheology modifiers such as RHEMOD™ L viscosifier and BaraVis® IE-568 viscosifier.

Applications/Functions

- Helps viscosify organophilic clay-free systems (BaraXcel™ and BaraECD® drilling fluid systems)
- Improves hole cleaning during drilling and workover operations
- Extends liquid polymeric viscosifier products for maximum yield and long-term suspension of weighting agents
- Enhances low shear rheology and gel strengths

Advantages

- Does not contribute to cold-temperature viscosity increases in deepwater or arctic applications
- Helps improve emulsion stability
- Particle size and shape allow for the use of 325-mesh shaker screens with minimal depletion

Typical Properties

- Appearance: Powder, variable in color
- Bulk density, compacted: 54 lb/ft³ (865 kg/m³)
- Bulk density, uncompacted: 39 lb/ft³ (625 kg/m³)

Recommended Treatment

With BaraXcel 4 and BaraXcel 5 fluids, typical treatments range from 2.0 to 5.0 lb/bbl (2.9-14.3 kg/m³). Low weight BaraXcel 1 and BaraXcel 3 systems (9.0-12.5 lb/gal density range) typically require a minimum of 6.0 lb/bbl (17.1 kg/m³). Higher concentrations may be used if required. For optimum Tau zero values and gel strengths, additions of TAU-MOD should continue even as drilled solids concentrations increase.

Packaging

TAU-MOD viscosifier is packaged in 50-lb (22.7-kg) sacks.

RHEMOD™ L

VISCOSIFIER

Product Description

RHEMOD™ L viscosifier is a liquid additive that is used to increase low end rheology while providing suspension and hole cleaning capabilities in invert emulsion drilling fluids. It is designed for organoclay-free high performance drilling fluids. RHEMOD L viscosifier can be used at temperatures up to 400°F (204°C).

Applications/Functions

- Helps increase viscosity and suspension properties of non-aqueous fluids
- Helps stabilize emulsion as a secondary function
- Can be used in systems formulated with or without organophillic clay

Advantages

- Helps increase rheology at low concentrations
- Helps increase low shear rate rheological properties
- Helps improve the typical flat gels of invert fluids
- Stable up to 400°F (204°C)
- Can be used with all non-aqueous fluids

Typical Properties

- Form: Amber viscous liquid
- Specific Gravity: 0.96

Recommended Treatment

Add 1 to 4 lb/bbl (2.9-11.4 kg/m^3) for viscosity.

Avoid overtreatment due to viscosity increase with increase of low gravity solids.

Packaging

RHEMOD L viscosifier is packaged in 55-gal (208.2-1) drums and bulk.

SOURSCAV®

SCAVENGER

Product Description

SOURSCAV® scavenger is a water soluble hydrogen sulfide scavenger suitable for use in non-aqueous and water-based drilling fluids. The solubility of SOURSCAV scavenger aids its availability and reaction rate. Sulfide removal using SOURSCAV is faster and more thorough than using insoluble scavengers.

Applications/Functions

- Sour drilling
- Drilling fluids
- Waste disposal

Advantages

- Environmental profile
- High solubility
- Zinc free

Typical Properties

Appearance:	Grey to green powder
pH (1% solution):	4.5
Specific gravity:	0.7

Recommended Treatment

Operational conditions such as the fluid type, circulation rate, temperature and rate of hydrogen sulfide influx will impact the rate and extent of the scavenging reaction. Prior to drilling a sour section the sulfide loading should be anticipated and the SOURSCAV concentration and treatment rate should be calculated.

Packaging

SOURSCAV scavenger is packaged in 55-lb (25-kg) bags and pails.

STEELSEAL® 50

LOST CIRCULATION MATERIAL

Product Description

STEELSEAL® 50 lost circulation material is a highly resilient, angular, dual-composition carbon-based material that allows tightly packed particles under compression in fractures and pores to expand or contract without being dislodged or collapsed due to changes in differential pressures. This property is termed "resiliency" and results during manufacture by a proprietary furnace process. This process raises the carbon content as high as 99.9and significantly reduces most heavy metals, such as iron, nickel and antimony, to very low levels – less than 10, 5 and 0.05 parts per million, respectively. During the high temperature purification process, graphitic properties are imparted to the petroleum coke feed stock. Resiliency, ranging from 80-95% at 10,000 p.s.i., is achieved in this process.

Applications/Functions

- Lost circulation treatments for pore plugging and small induced and natural fractures
- Aids in preventing seepage losses, wellbore breathing and stuck pipe in porous and/or depleted formations
- STEELSEAL 50 highly resilient lost circulation material is utilized in water–based, synthetic-based and oil-based drilling fluids
- In water-based fluids, it also performs as a solid lubricant for torque and drag reduction

Advantages

- Designed for lost circulation prevention in all fluids
- Minimal effect on viscosity
- High loadings without detrimental effect on Equivalent Circulating Density
- Minimal effect on Equivalent Circulation Density when used as a background material
- Enhances fluid loss control and provides pore plugging for depleted porous formations
- Smaller size allows greater retention within fluids even with fine mesh screens
- Exhibits a resiliency that allows it to remain closely packed within a fracture or pore throat

Typical Properties

Appearance:	Solid black, angular material
Specific gravity:	1.88
Particle size d50:	50 +/- 10 microns
Composition minimum:	99 to 99.9% carbon
Solubility:	Not soluble

Recommended Treatment

1. As a background concentration for seepage and lost circulation control, 15-25 lb/bbl (40-70 kg/m³).
2. For lubricity in water-based fluids, 4-10 lb/bbl (10-30 kg/m³).
3. WellSET® treatments use 10-30 lb/bbl (60-140 kg/m³) STEELSEAL 50 highly resilient lost circulation material with BARACARB® ground marble and other sized resilient graphitic carbon materials.

Packaging

STEELSEAL 50 highly resilient lost circulation material is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks and in 2000-lb (907-kg) bulk bags.

STEELSEAL® 100

LOST CIRCULATION MATERIAL

Product Description

STEELSEAL® 100 lost circulation material is a highly resilient, angular, dual-composition carbon-based material that allows tightly packed particles under compression in fractures and pores to expand or contract without being dislodged or collapsed due to changes in differential pressures. This property is termed "resiliency" and results during manufacture by a proprietary furnace process. This process raises the carbon content as high as 99.9and significantly reduces most heavy metals, such as iron, nickel and antimony, to very low levels – less than 10, 5 and 0.05 parts per million, respectively. During the high temperature purification process, graphitic properties are imparted to the petroleum coke feed stock. Resiliency, ranging from 90-100% at 10,000 p.s.i., is achieved in this process.

Applications/Functions

- Lost circulation treatments for pore plugging and small induced and natural fractures
- Aids in preventing seepage losses, wellbore breathing and stuck pipe in porous and/or depleted formations
- STEELSEAL 100 highly resilient lost circulation material is utilized in water–based, synthetic-based and oil-based drilling fluids
- In water-based fluids, it also performs as a solid lubricant for torque and drag reduction

Advantages

- Designed for lost circulation prevention in all fluids
- Minimal effect on viscosity
- High loadings without detrimental effect on Equivalent Circulating Density
- Minimal effect on Equivalent Circulation Density when used as a background material
- Enhances fluid loss control and provides pore plugging for depleted porous formations
- Smaller size allows greater retention within fluids even with fine mesh screens
- Exhibits a resiliency that allows it to remain closely packed within a fracture or pore throat

Typical Properties

Appearance:	Solid black, angular material
Specific gravity:	1.82
Particle size d50:	100 +/- 25 microns
Composition minimum:	99 to 99.9% carbon
Solubility:	Not soluble

Recommended Treatment

1. As a background concentration for seepage and lost circulation control, 15-25 lb/bbl (40-70 kg/m³).
2. LCM pill for spotting over thief zones or on bottom prior to trips, 60-110 lb/bbl (170-310 kg/m³).
3. For lubricity in water-based fluids, 4-10 lb/bbl (10-30 kg/m³).
4. WellSET® treatments use 10-30 lb/bbl (60-140 kg/m³) STEELSEAL 100 highly resilient lost circulation material with BARACARB® ground marble and other sized resilient graphitic carbon materials.

Packaging

STEELSEAL 100 highly resilient lost circulation material is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks and in 2000-lb (907-kg) bulk bags.

STEELSEAL® 400

LOST CIRCULATION MATERIAL

Product Description

STEELSEAL® 400 lost circulation material is a highly resilient, angular, dual-composition carbon-based material that allows tightly packed particles under compression in fractures and pores to expand or contract without being dislodged or collapsed due to changes in differential pressures. This property is termed "resiliency" and results during manufacture by a proprietary furnace process. This process raises the carbon content as high as 99.9and significantly reduces most heavy metals, such as iron, nickel and antimony, to very low levels – less than 10, 5 and 0.05 parts per million, respectively. During the high temperature purification process, graphitic properties are imparted to the petroleum coke feed stock. Resiliency, ranging from 100-115% at 10,000 p.s.i., is achieved in this process.

Applications/Functions

- Lost circulation treatments for moderate size induced and natural fractures
- Suspends bridging agents and weighting materials in aqueous based fluid systems
- Medium particle size resilient graphitic carbon for WellSET® treatments
- STEELSEAL 400 highly resilient lost circulation material is utilized to stop losses in porous and fractured formations in water-based, synthetic-based and oil-based drilling fluids
- In water-based fluids, it also performs as a solid lubricant for torque and drag reduction

Advantages

- Designed for lost circulation prevention in all fluids
- Minimal effect on viscosity
- High loadings without detrimental effect on Equivalent Circulating Density
- Exhibits a resiliency that allows it to remain closely packed within a fracture or pore throat
- Minimal effect on Equivalent Circulation Density when used as a background material
- Can impart resiliency to appropriately sized combinations of materials, that are themselves non-resilient, at pressures greater than 5,000 psi

Typical Properties

Appearance:	Solid black, angular material
Specific gravity:	1.71
Particle size d50:	400 +/- 50 microns
Composition minimum:	99 to 99.9% carbon
Solubility:	Not soluble

Recommended Treatment

1. As a background concentration for seepage and lost circulation control, 15-25 lb/bbl (40-70 kg/m³).
2. LCM pill for spotting over thief zones or on bottom prior to trips, 50-100 lb/bbl (140-300 kg/m³).
3. For lubricity in water-based fluids, 3-10 lb/bbl (10-30 kg/m³).
4. WellSET® treatments use 20-50 lb/bbl (60-140 kg/m³) STEELSEAL 400 highly resilient lost circulation material with BARACARB® ground marble and other sized resilient graphitic carbon materials.
5. As a resiliency enhancer in combination with other appropriately sized materials, use STEELSEAL 400 highly resilient lost circulation material at 20 volume percent, or greater.

Packaging

STEELSEAL 400 highly resilient lost circulation material is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks and in 2000-lb (907-kg) bulk bags

STEELSEAL® 1000

LOST CIRCULATION MATERIAL

Product Description

STEELSEAL® 1000 lost circulation material is a highly resilient, angular, dual-composition carbon-based material that allows tightly packed particles under compression in fractures and pores to expand or contract without being dislodged or collapsed due to changes in differential pressures. This property is termed "resiliency" and results during manufacture by a proprietary furnace process. This process raises the carbon content as high as 99.9 and significantly reduces most heavy metals, such as iron, nickel and antimony, to very low levels – less than 10, 5 and 0.05 parts per million, respectively. During the high temperature purification process, graphitic properties are imparted to the petroleum coke feed stock. Resiliency, ranging from 110-120% at 10,000 p.s.i., is achieved in this process.

Applications/Functions

- Lost circulation treatments for moderate size induced and natural fractures
- Large particle size resilient graphitic carbon for WellSET® treatments
- STEELSEAL 1000 highly resilient lost circulation material is utilized to stop losses in porous and fractured formations in water-based, synthetic-based and oil-based drilling fluids
- In water-based fluids, it also performs as a solid lubricant for torque and drag reduction

Advantages

- Designed for lost circulation prevention in all fluids
- Minimal effect on viscosity
- High loadings without detrimental effect on Equivalent Circulating Density
- Exhibits a resiliency that allows it to remain closely packed within a fracture or pore throat
- Minimal effect on Equivalent Circulation Density when used as a background material
- Can impart resiliency to appropriately sized combinations of materials, that are themselves non-resilient, at pressures greater than 5,000 psi

Typical Properties

Appearance:	Solid black, angular material
Specific gravity:	1.58
Particle size d50:	1000 +/- 100 microns
Composition minimum:	99 to 99.9% carbon
Solubility:	Not soluble

Recommended Treatment

1. LCM pill for spotting over thief zones or on bottom prior to trips, 50-100 lb/bbl (140-300 kg/m³).
2. For lubricity in water-based fluids, 3-10 lb/bbl (10-30 kg/m³).
3. WellSET® treatments use 20-50 lb/bbl (60-140 kg/m³) STEELSEAL 1000 lost circulation material with BARACARB® ground marble and other sized resilient graphitic carbon materials.
4. As a resiliency enhancer in combination with other appropriately sized materials, use STEELSEAL 1000 highly resilient lost circulation material at 20 volume percent, or greater.

Packaging

STEELSEAL 1000 highly resilient lost circulation material is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks and in 2000- lb (907-kg) bulk bags

STEELSEAL®

LOST CIRCULATION MATERIAL

Product Description

STEELSEAL® lost circulation material is a highly resilient, angular, dual-composition carbon-based material available in five different particle sizes. Unlike other graphite-type materials, STEELSEAL particles have high resiliency ranging from 50-120% at pressures of 5,000-10,000 p.s.i. as a result of the specialized high-temperature manufacturing process. This unique resilience property allows the material to tightly pack under compression in fractures and pores, then expand or contract due to changes in differential pressure without being crushed or dislodged; resulting in excellent prevention of lost circulation over a wide range of fractured and depleted formation types.

Applications/Functions

- Provides lost circulation treatments for a wide range of induced and natural fractures
- Offers multiple particle sizes for customized WellSET® treatments
- Is suitable for use in water-based and non-aqueous drilling fluids
- Performs as a solid lubricant for torque and drag reduction in some applications

Advantages

- Designed for lost circulation prevention in all fluid types
- Exhibits resiliency that allows particles to remain closely packed within fractures and/or pore throats
- Minimal effect on fluid rheology parameters when used as a constant background material
- Can impart resiliency to combination blends of non-resilient materials, at pressures greater than 5,000 p.s.i.

Typical Properties

Appearance:	Solid black, angular material
Solubility:	Not soluble

Specific Grades

STEELSEAL®	25	50	100	400	1000
Particle Size d50, microns	25 ± 5	50 ± 10	100 ± 25	400 ± 50	1000 ± 100
Specific gravity, g/cc	1.8-2.1	1.7-2.0	1.7-2.0	1.5-1.7	1.3-1.8

Recommended Treatments

1. STEELSEAL can be used as a background preventative material for seepage and lost circulation control at 10-40 lb/bbl (29-114 kg/m³).
2. LCM pills for spotting over thief zones or on bottom prior to trips, 50-100 lb/bbl (140-300 kg/m³).
3. For lubricity in water-based fluids, 3-10 lb/bbl (10-30 kg/m³).
4. WellSET® treatments use engineered combinations of loss preventative materials consisting of 20-50 lb/bbl (60-140 kg/m³) selected from STEELSEAL, BARACARB® ground marble and other lost circulation control materials. To impart resiliency to these combination treatments, include at least 20% by volume STEELSEAL, or greater.

Packaging

STEELSEAL highly resilient lost circulation material is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks and in 2000-lb (907-kg) bulk bags

STEELSEAL® 25

LOST CIRCULATION MATERIAL

Product Description

STEELSEAL® 25 lost circulation material is a highly resilient, angular, dual-composition carbon-based material that allows tightly packed particles under compression in fractures and pores to expand or contract without being dislodged or collapsed due to changes in differential pressures. This property is termed "resiliency" and results during manufacture by a proprietary furnace process. This process raises the carbon content as high as 99.9%, and significantly reduces most heavy metals, such as iron, nickel and antimony, to very low levels – less than 10, 5 and 0.05 parts per million, respectively. During the high temperature purification process, graphitic properties are imparted to the petroleum coke feed stock. Resiliency, ranging from 80-95% at 10,000 p.s.i., is achieved in this process.

Applications/Functions

- Lost circulation treatments for pore plugging and small induced and natural fractures
- Aids in preventing seepage losses, wellbore breathing and stuck pipe in porous and/or depleted formations
- STEELSEAL 25 highly resilient lost circulation material is utilized in water–based, synthetic-based and oil-based drilling fluids
- In water-based fluids, it also performs as a solid lubricant for torque and drag reduction

Advantages

- Designed for lost circulation prevention in all fluids
- Minimal effect on viscosity
- High loadings without detrimental effect on Equivalent Circulating Density
- Exhibits a resiliency that allows it to remain closely packed within a fracture or pore throat
- Smaller size allows greater retention within fluids even with fine mesh screens
- Minimal effect on Equivalent Circulation Density when used as a background material
- Enhances fluid loss control and provides pore plugging for depleted porous formations
- Effective in all oil and invert emulsion systems

Typical Properties

Appearance:	Solid black, angular material
Solubility:	Not soluble
Specific gravity:	1.95
Particle size d50:	25 +/- 5 microns
Composition minimum:	99 to 99.9% carbon

Recommended Treatment

1. As a background concentration for seepage and lost circulation control, 15-25 lb/bbl (40-70 kg/m³).
2. For lubricity in water-based fluids, 4-10 lb/bbl (10-30 kg/m³).
3. WellSET® treatments use 10-30 lb/bbl (60-140 kg/m³) STEELSEAL 25 highly resilient lost circulation material with BARACARB® ground marble and other sized resilient graphitic carbon materials.

Packaging

STEELSEAL 25 highly resilient lost circulation material is packaged in 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks and in 2000-lb (907-kg) bulk bags.

STOPPIT®

LOST CIRCULATION MATERIAL

Product Description

STOPPIT® lost circulation material (LCM) may be used as a stand-alone treatment or as a supplement to other lost circulation treatments. This combination of material sizes and types may further optimize particle size distributions for improved effectiveness. This is demonstrated by laboratory data showing more efficient sealing of 2,540 micron slotted disks when this material is substituted into a formulation.

Applications/Functions

- STOPPIT LCM can work effectively in a wide range of fluid loss situations, and can be used in all types of drilling fluids to seal off loss zones quickly and economically.

Advantages

- Spotting a LCM pill contacting STOPPIT LCM can help save rig time and operational costs since no trip out of wellbore, no special pumping or mixing equipment, and no specialized spacers are required.

Typical Properties

- Appearance: Coarse, granular material
- Specific gravity: 1.5
- Particle size, (d90, nominal): 2,672 microns
- Particle size, (d50, nominal): 1,390 microns
- Particle size, (%<5 mesh): 100%

Recommended Treatment

STOPPIT LCM can be used as a stand-alone treatment at 50-80 ppb or as a supplement to other materials from 10-50 ppb.

Packaging

STOPPIT LCM is packaged in a 50-lb bag.

Suspension Package 1, 2, 3

SUSPENSION AGENT

Product Description

Baroid Suspension Package 1, 2 and 3 suspension agents are an integral part of BaraECD® High-Performance Drilling Fluid System. These suspension package agents help to stabilize emulsions and improve the sag resistance of non-aqueous drilling fluids.

Applications/Functions

- For use in conjunction with BaraECD drilling fluid system
- Improved low end rheology and sag resistance
- Aids in formulation of low ECD drilling fluids

Advantages

- Improves weight material suspension
- Increases sag resistance
- Does not cause significant increases in fluid plastic viscosity
- Enhances the function of liquid system viscosifiers
- Stabilizes fluid rheological properties

Typical Properties

Appearance:	Light Tan Solid
Specific gravity:	2.4 – 2.6

Recommended Treatment

Suspension Package 1, 2 and 3 suspension agents are part of a specific formula used to create the BaraECD drilling fluid system. The suspension agents should be added only at the prescribed concentration. New fluid volume should be built using all components of the BaraECD drilling fluid system at their recommended concentrations. Suspension packages 1, 2 and 3 should not be added as standalone products. The three Suspension Package blends consist of particles with specific shapes, surface charge density and size to provide optimum yield with a variety of base fluids and weighting materials. Suspension Packages 1 and 3 are commonly used in olefin-based systems, while Suspension Package 2 is often used with other synthetic and refined petroleum distillate base fluids.

Packaging

All suspension packages are available in 50-lb (22.7-kg) bags.

SUSPENTONE™

SUSPENSION AGENT

Product Description

SUSPENTONE™ suspension agent provides increased suspension of weighting agents and drill solids in invert emulsion fluids without a significant contribution to plastic viscosity. SUSPENTONE suspension agent is an organophilic clay that is suitable for all conventional invert emulsion fluids in applications up to 400°F (205°C). Compared to GELTONE® viscosifier products, SUSPENTONE suspension agent gives similar suspension properties with lower overall viscosity.

Applications/Functions

- Helps improve suspension qualities of invert emulsions and all-oil drilling fluids
- Helps reduce sagging or settling tendencies in deviated or high-angle wellbores
- Condition oil muds for storage

Advantages

- Can readily disperse
- Does not significantly increase rheological properties
- Stable at temperatures approaching 400°F (205°C)

Typical Properties

- Appearance: Tan powder
- Bulk density, compacted: 50lb/ft³ - 801kg/m³
- Bulk density, uncompacted: 35lb/ft³ - 561kg/m³

Recommended Treatment

Add 1-5 lb/bbl (2.9-14.3 kg/m³) of SUSPENTONE suspension agent.

Packaging

SUSPENTONE suspension agent is packaged in 50-lb (22.7-kg) sacks.

SWEEP-WATE®

WEIGHTING MATERIAL

Product Description

SWEEP-WATE® weighted sweep material is selectively sized Barite designed for use in high-density sweeps and slugs to enhance hole cleaning in deviated wells. The increased buoyancy of these sweeps and slugs helps in transporting cuttings to surface. Most rig shale shakers remove SWEEP-WATE weighted sweep easily from the fluid, allowing low system mud weights to be maintained without dilution.

Applications/Functions

- Helps enhance hole cleaning in deviated wells
- High density sweeps and slugs

Advantages

- High density sweeps maintain low mud weight with minimal dilution to the system due to easy removal of SWEEP-WATE weighting material by the shakers
- Chemically inert
- Cost-effective
- Remove slugs to maintain low mud weight

Typical Properties

Appearance:	Coarse powder
Specific Gravity:	3.5 minimum
Particles through, a US #30 mesh (600µ) or A:	100%
Particles retained, on a US #120 mesh (125 µ):	90%

Recommended Treatment

Add 2-4 lb/gal (239.7-479.3 kg/m³) greater than the existing system.

Note: High density volume should cover 300-400 feet (91-122 meters) of annular open hole.

Packaging

SWEEP-WATE weighted sweep material is packaged in 50-lb (22.7-kg) sacks and 2000-lb (906.6-kg) bulk bags.

TEMPERUS™

VISCOSIFIER

Product Description

TEMPERUS™ viscosifier is used to provide temporary viscosity in oil-based drilling fluids. It helps increase the low-shear and static suspension capabilities of oil-based drilling fluids at low temperatures, which helps prevent solids settling in new fluids. As fluid temperatures increase beyond 120°F (49°C) the effects of TEMPERUS viscosifier will gradually disappear until 150°F (66°C) where the effects will disappear completely.

Applications/Functions

Helps viscosify non-aqueous muds to prevent settling during transport.

Advantages

- Can allow shipment of muds without excessive additions of organophilic clay
- Viscosity begins to decrease at 120°F (49°C), and completed by 150°F (66°C)

Typical Properties

Appearance:	Dark liquid
Specific Gravity:	0.99
Pour Point:	0°F (-18°C)

Recommended Treatment

Add 0.25 to 2 lb/bbl (0.7-5.7 kg/m³) of TEMPERUS viscosifier.

The viscosity of muds mixed with TEMPERUS viscosifier will decrease after extended periods of low shear. A shipment yield point of 25 lb/100ft² or higher is recommended.

Packaging

TEMPERUS viscosifier is packaged in 5-gal (18.9-l) and 55-gal (208-l) drums.

THERMA-CHEK®

FILTRATION CONTROL ADDITIVE

Product Description

THERMA-CHEK® filtration control additive provides filtration control and secondary viscosity for most water-based drilling fluids at temperatures beyond 400°F (204°C). Use of THERMA-CHEK filtration control additive is not recommended until bottom hole temperatures reach 300°F (149°C) where it can be used to supplement and replace existing fluid loss control products as temperatures increase. THERMA-CHEK filtration control additive is not suitable for fluids with over 5000 ppm potassium ion content.

Applications/Functions

THERMA-CHEK filtration control additive can be used in fresh water and salt water systems to improve filtration control and impart supplementary viscosity at temperatures beyond 400°F (204°C).

Advantages

- Helps provide filtration control for a wide variety of mud systems
- Excellent high temperature stability
- Environmentally responsible
- Can provide secondary viscosity
- Is tolerant to salt and divalent ions

Typical Properties

Appearance:	White or cream powder
Specific Gravity:	1.32
pH, (1% aqueous solution):	6.5

Recommended Treatment

1. For fresh water systems, add 1-3 lb/bbl (2.85- 8.56 kg/m³).
2. For salt water systems, add 4-8 lb/bbl (11.41- 22.82 kg/m³).

Caution: Do not use THERMA-CHEK filtration control additive in systems that contain more than 5000 mg/l of potassium.

Packaging

THERMA-CHEK filtration control additive is packaged in 25-lb (11.3-kg) and 55.1-lb (25-kg) sacks.

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THERMA-FLOW 500®

Thinner — Product Data Sheet

Product Description

THERMA-FLOW 500® thinner is an environmentally friendly deflocculant / dispersant that is used to control thermal gelation while stabilizing rheological properties in HPHT water based fluids. It is effective over broad pH ranges and mud types and particularly efficient in lowering PV's in high temperature, high density fluids.

Applications / Functions

- High temperature water-based mud conditioner used in a variety of water-based mud systems
- Helps maintain HPHT WBM viscosity and rheology by acting as a deflocculant in high solids, high density muds (i.e. >18 ppg fluids)
- Performs in temperatures in excess of 400°F (204°C) to minimize high temperature gelation.

Advantages

- Low PV plastic viscosity
- Aids in maintaining acceptable YP (yield point)
- Low PV with acceptable YP allows for low ECD while maintaining excellent hole cleaning
- Minimal losses while drilling and while running casing
- Good hole cleaning characteristics were reported in the hole sections where the new additive was implemented in the field
- Fluid stability to bottom hole static temperatures in excess of 400°F (204°C) even after extended logging time
- Environmentally friendly

Typical Properties

Appearance	Clear yellow liquid
pH, (neat)	5.5
Pour point	< 41°F (5 °C)
Specific gravity	1.25

Recommended Treatment

Treatment is usually 1 to 4% v/v depending upon mud condition, mud weight, BHT, MBT and colloidal solids content.

Packaging

THERMA-FLOW 500 thinner is packaged in 250-kg net HDPE drums.

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THERMA-THIN®

THINNER

Product Description

THERMA-THIN® thinner is used in water-based systems to control rheological properties and to impart high temperature stability. THERMA-THIN thinner is an effective deflocculant that can be used at a wide range of pH and is suitable for use up to 450°F (232°C). THERMA-THIN thinner can be used as a stand-alone product, or in combination with other thinners, such as lignosulfonates, that operate by different thinning mechanisms. THERMA-THIN thinner is particularly efficient in fresh water systems with low to medium solids concentrations.

Applications/Functions

- Deflocculate most water-based systems
- Helps minimize thermal flocculation
- Helps reduce shear strength development

Advantages

- Effective in the presence of salt and divalent ions
- Environmentally acceptable
- Compatible with other common mud additives
- Stable at temperatures above 450°F (232°C)
- Not pH dependent

Typical Properties

Appearance:	Pale clear to light amber
pH:	8
Specific Gravity:	1.24

Recommended Treatment

Add 1-4 lb/bbl (2.85-11.41 kg/m³) of THERMA-THIN deflocculant to the system.

Notes:

When adding prehydrated bentonite to a salt water system, add THERMA-THIN thinner to the slurry to help minimize flocculation.

THERMA-THIN thinner is not recommended for use in high lignite systems. It performs better when starches, cellulosic or high temperature synthetic polymers (such as THERMA-CHEK® filtration control agent) are used for filtration control.

Packaging

THERMA-THIN thinner is packaged in 5-gal (18.9-l) cans, 25-kg cans and 55-gal (208-l) drums.

THERMA-VIS™

VISCOSIFIER

Product Description

THERMA-VIS™ viscosifier is a synthetic Hectorite and is used in THERMA-DRIL™ high-temperature water-based drilling fluids. THERMA-VIS viscosifier is stable at temperatures of up to 700°F (370°C) and does not thermally flocculate but is not tolerant of salinity. THERMA-VIS viscosifier is recommended to viscosify geothermal drilling fluids.

Applications/Functions

- Formulate geothermal drilling fluids
- Viscosify water-based drilling fluids in high temperature applications

Advantages

- Helps maintain stable rheological properties with increasing temperature
- Is shear thinning
- Does not thermally flocculate
- Environmentally responsible

Typical Properties

Appearance:	White powder
pH, (1% aqueous solution):	7.5
Bulk density:	62.4lb/ft³ - 1000kg/m³

Recommended Treatment

Add 1-4 lb/bbl (2.9-11.4 kg/m³).

Note:

For maximum yield, hydrate THERMA-VIS visocosifier for a minimum of 16 hours.

Packaging

THERMA-VIS visocosifier is packaged in 5-gal (18.9-l) cans containing 55.1-lb (25-kg) sacks.

TORQ-TRIM® 22

LUBRICANT

Product Description

TORQ-TRIM® 22 lubricant is effective for water based fluids and brines to reduce torque and drag. TORQ-TRIM 22 lubricant is a mixture of surfactants and non-oil lubricants, has good bio-degradability and is effective in a wide variety of fluids. TORQ-TRIM 22 lubricant is tolerant of high pH and divalent ions, is compatible with most common elastomers, and is stable to 300°F (149°C). TORQ-TRIM 22 lubricant is preferred over TORQ-TRIM® II lubricant in brine based fluids. TORQ-TRIM 22 lubricant has an excellent performance track record with good return permeability testing results.

Applications/Functions

- Helps lower drilling torque by improving the lubricity of most water-based fluids
- Helps reduce metal to metal friction which helps protect casing in deviated holes
- Helps provide a slick filter cake and reduces the risk of differential sticking when used as a pretreatment

Advantages

- Can impart excellent lubricity
- Can readily biodegrade
- Has low toxicity and no sheen from discharges
- Contributes to API and HTHP filtration

Typical Properties

Appearance	Amber, slight hazy, liquid
Specific gravity	1.01
pH	6.5

Recommended Treatment

Add 1.5-4% of TORQ-TRIM 22 lubricant by volume.

Packaging

TORQ-TRIM 22 lubricant is available in 5-gal (18.9-l), 55-gal (210-l) and 200-kg drums.

TORQ-TRIM® II

DRILLING LUBRICANT

Product Description

TORQ-TRIM® II is an amide-based additive for the reduction of torque and drag in water-based drilling fluids. TORQ-TRIM II is suitable for a range of drilling fluids, including those containing calcium salts. TORQ-TRIM II contains a solvent which enhances water solubility and lowers the pour point. TORQ-TRIM II is biodegradable and does not fluoresce. TORQ-TRIM II will maintain stability and performance at temperatures up to 400ºF (204ºC).

Applications/Functions

- Reduces metal/metal and metal/rock friction
- Reduces frictional torque and drag
- Improves the lubricating qualities of water-based drilling fluids

Advantages

- Effective in mono- and divalent brines
- High temperature stability
- No adverse effects on drilling fluid stability

Typical Properties

Appearance	Clear amber liquid
Specific gravity	0.89
Freezing point	-6ºF (-21ºC)
Flash point	64ºF (18ºC)

Recommended Treatment

Lubrication can be achieved with concentrations of around 3% v/v TORQ-TRIM II. After initial treatment, periodic applications will maintain the desired concentration and performance.

Caution – TORQ-TRIM II may emulsify oil into water-based fluids. The risk of oil ingress must be assessed and the effects of contamination should be tested.

Packaging

TORQ-TRIM II is packaged in 55 gal (208 liter) drums and 275 gal (1040 liter) tote tanks.

VIS-PLUS®

SUSPENSION AGENT

Product Description

VIS-PLUS® suspension agent is used to increase the low-end rheology and suspension properties of invert emulsion and all-oil drilling fluids. VIS-PLUS suspension agent can also be used to reduce top-oil separation under static conditions. VIS-PLUS suspension agent is a non-clay, organic viscosifier and will require alkalinity to work properly. VIS-PLUS suspension agent is suitable for all invert emulsion fluids and is stable to 175°F (79°C).

Applications/Functions

- Helps control top-oil separation
- Helps assist in high temperature stabilization

Advantages

- Stable to 175°F (79°C)
- Aids in filtration control

Typical Properties

Appearance:	White flakes or powder
Specific Gravity:	0.85
Flash point:	365°F (185°C)
Melting point:	126 – 135°F (52 – 57°C)

Recommended Treatment

Add 1-3 lb/bbl (2.85-8.56 kg/m³) of VIS-PLUS suspension agent.

Packaging

VIS-PLUS suspension agent is packaged in 44.1-lb (20-kg), 50-lb (22.7-kg) and 55.1-lb (25-kg) sacks.

ZEOGEL®

VISCOSIFIER

Product Description

ZEOGEL® viscosifier is premium Attapulgite clay that exceeds API Specification 13A Section 12 viscosity requirements. It is used to provide viscosity and hole cleaning capabilities in drilling fluids with high concentrations of salts. It is very effective in fluids containing high concentrations of divalent ions such as calcium or magnesium.

Applications/Functions

ZEOGEL viscosifier can be used to build viscosity in drilling fluids having a high salt concentration

Advantages

- Unaffected by common contaminants
- Does not flocculate

Typical Properties

- Appearance: Powder, variable in color
- Specific Gravity: 2.4
- Bulk density, compacted: 54lb/ft³ (865kg/m³)
- Bulk density, uncompacted: 39lb/ft³ (625kg/m³)

Recommended Treatment

Add 5-30 lb/bbl (14.3-85.6 kg) of ZEOGEL viscosifier through the hopper.

Packaging

ZEOGEL viscosifier is packaged in 50-lb (22.7-kg) sacks.

Sales of Halliburton products and services will be in accord solely with the terms and conditions contained in the contract between Halliburton and the customer that is applicable to the sale.

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