DRILLING FLUIDS SELECTION GUIDE

BENTONITE

Baroid Industrial Drilling Products, (281) 871-4613, baroididp.com

AQUAGEL Viscosifier: Premium-grade Wyoming sodium bentonite used as viscosifier and filtrate reducer in freshwater drilling fluids. Meets the requirements of API Specification 13A, Section 9; certified to NSF/ANSI Standard 60.

BORE-GEL Boring Fluid System: A specifically blended system using high-yield Wyoming sodium bentonite. When mixed with freshwater, it develops an easy-to-pump slurry with desirable properties for HDD drilling, pipe jacking lubrication, etc. Certified to NSF/ANSI Standard 60.

QUIK-GEL Viscosifier: Easy-to-mix, finely ground, premium grade, high-yield Wyoming sodium bentonite. Imparts viscosity, fluid-loss control and gelling characteristics to freshwater-based fluids. Certified to NSF/ANSI Standard 60.

QUIK-BORE High-Yield Boring Fluid System: A specially formulated product for use in HDD, primarily tunneling and micro-tunneling applications. Certified to NSF/ ANSI/CAN Standard 60.

BORE-GROUT Pumpable Bentonite Grout: A pumpable material for use in grouting a wide array of horizontal and vertical applications, including borehole abandonment, development of annular seals in wells, horizontally installed product lines and/or horizontal ground source heat loops. Designed to be mixed and pumped with standard equipment.

Bentonite Performance Minerals, LLC, (281) 871-7900, bentonite.com

BARA-KADE PLUS: High-yield, premium Wyoming sodium bentonite that is easy to mix and imparts viscosity, increases bore-hole stability, and suspends drill cuttings in water-based drilling fluids. Certified to NSF/ANSI/CAN Standard 60.

BARA-KADE 90: Wyoming sodium bentonite that meets API 13A, Section 9 specifications for use in trenching, bored piling, and slurry wall installations. Certified to NSF/ANSI/CAN Standard 60.

CETCO, (800) 527-9948, cetco.com/dpg

HYDRAUL-EZ: Specially treated bentonite drilling fluid designed for directional drilling. Suspends cuttings and maintains borehole integrity with very low water loss and strong gel strength. Certified to NSF/ANSI/CAN Standard 60.

SUPER GEL-X: A 200-bbl-yield, bentonite drilling fluid for maximum viscosity. Multipurpose drilling gel provides strong wall cake and formation control for all drilling types. Controls filtration rate for borehole stabilization and prevention of fluid loss. Certified to NSF/ANSI/CAN Standard 60.

PREMIUM GEL: API 13A 90-bbl-yield, bentonite drilling fluid for freshwater drilling. Certified to NSF/ANSI/CAN Standard 60.

PUREGOLD GEL: Organic-free and untreated 90-bbl-yield, high-quality bentonite drilling fluid. Industry standard for environmental monitoring well drilling. Certified to NSF/ANSI/CAN Standard 60.

Drilling Mud Direct LLC, (720) 489-0300, www.muddirect.net

Barakade High Yield Gel: Premium-grade, high-yield Wyoming sodium bentonite. Easy to mix, quick to yield and provides excellent rheology for HDD applications. Stored at 12 different stock points across the USA to ensure big-rig contractors never run out of mud. Certified to NSF/ANSI-standard 60.

M-I SWACO, (601) 649-1500, slb.com/hdd

MAX BORE HDD: One-sack, proprietary-blend system of high-yield Wyoming bentonite with additives for fluid loss control, enhanced suspension and improved lubricating qualities. Designed for gravel and cobble formations where optimum stabilization and suspension are necessary. Certified to NSF/ANSI/CAN 60.

MAX GEL: Premium 220+ bbl-yield, Wyoming bentonite capable of yielding more than twice as much viscosity as regular Wyoming bentonite. Easily mixes and yields faster than most other bentonites. Certified to NSF/ANSI/CAN 60.

M-I GEL: Premium-grade bentonite (a sodium montmorillonite clay) that will yield 91-100 barrels of 15-cP mud per ton (1.7 m3/100 kg). Used as a primary filter-cakebuilding, filtration-control, and suspension agent in freshwater systems, and has application in all water-base mud systems. M-I Gel viscosifier meets ISO 13500 Clause 9 (formerly known as API Spec. 13A, Section 9) specifications for bentonite. Certified to NSF/ANSI/CAN 60.

DRILPLEX HDD: Specialty product used to enhance gel strengths of MAX GEL viscosifier. When added to bentonite, slurry produces high-fragile gels for superior suspension and carrying capacity of sand, gravel and rock cuttings from the borehole. Easy to pump, improves hole stability and reduces chances of loss circulation. Certified to NSF/ANSI/CAN 60.

Polymer Drilling Systems, (800) 243-7455, pdscoinc.com

High Yield: Specially modified for HDD or wherever a minimum 200-bbl yield is required. Mixes rapidly for quick hydration and carries cuttings in mud with lower soil content.

Wyo-Ben, Inc., (406) 652-6351, www.wyoben.com

Extra High Yield: High-yielding, fast-mixing gel that performs well in a variety of water qualities. Used widely in mineral exploration, water well and HDD.

Hydrogel Plus: High-performance bentonite with a unique formula that makes it a very effective viscosifier. This premium-grade, beneficiated Wyoming bentonite is specifically designed for use with mud recycling systems on large HDD bores.

SW-101: Unique modified sodium bentonite product designed to remain stable in either seawater- or salt-contaminated environments. Can be mixed in freshwater or seawater.

Tru-Bore: Complete, one-sack, 240-bbl/ton-yielding, pH-balanced material that controls fluid loss to the well bore for maximum borehole stability. For use in drilling difficult horizontal and vertical wells.

POLYMER

Baroid Industrial Drilling Products, (281) 871-4613, baroididp.com

AQUA-CLEAR PFD Polymer Dispersant: Concentrated, liquid, polymer dispersant that provides superior mud and sediment removal. Highly effective mud thinner containing no phosphates. Certified to NSF/ANSI Standard 60.

BIO-BORE HDD Fluid Concentrate: Polymer-based system that provides a clayfree, biodegradable drilling fluid in situations where clay-based fluids are restricted.

CLAY-DRILL Polymer-Based HDD Fluid: Designed to provide borehole stabilization, counteract the sticking tendencies of clay, and maximize clay/shale inhibition without the need for additional additives. Certified to NSF/ANSI/CAN Standard 60.

Drilling Fluids Selection Guide

DIAMOND SEAL Absorbent Polymer for Lost Circulation: Water-swellable – not water-soluble – 100% crystalline synthetic polymer. It absorbs hundreds of times its weight in water and is used primarily as a lost circulation material in HDD.

EZ-MUD PLUS Polymer Emulsion: Liquid polymer emulsion used as a borehole stabilizing agent to prevent reactive shale and clay from swelling and sloughing. Can be added to low-solids drilling fluids to help increase lubricity and fluid viscosity and improve carrying capacity of air/foam injection fluids. Certified to NSF/ANSI/CAN Standard 60.

EZ- MUD GOLD Clay and Shale Stabilizer: Helps promote inhibition of clay and shale formations in water-based drilling fluids without substantially increasing viscosity. Added to QUIK-GEL[®], QUIK-BORE™ or BORE-GEL[®] slurry, it yields an inhibitive drilling fluid system while maintaining manageable and effective fluid properties. Certified to NSF/ANSI/CAN Standard 60.

NO-SAG: Biopolymer Gel Strength Enhancer Free-flowing, powdered and easily dispersed biopolymer. Helps enhance the carrying capacity of both clay- and polymer-based drilling fluids without significantly increasing the viscosity of the slurry.

N-SEAL Acid Soluble Lost Circulation Material: Acid-soluble, lost circulation material is a specially formulated extrusion spun mineral fiber. Due to its solubility in weak acids, it is easily removed from production zones. Certified to NSF/ANSI/CAN Standard 60.

PENETROL Wetting Agent: Non-ionic wetting agent designed to counteract the sticking tendencies of clay and reduce or eliminate bit balling. Preferentially coats drill bits, drill string and reamers to improve drilling efficiency.

PENETROL DRY Dry Surfactant: Used to assist in counteracting the sticking tendencies of encountered clay or shale during drilling operations. Surfactant of choice for environmentally sensitive projects. Certified to NSF/ANSI/CAN Standard 60.

PERFORMATROL 930 Clay Inhibition System: Designed to provide borehole stabilization, minimize core infiltration, and maximize clay and shale inhibition. Certified to NSF/ANSI/CAN Standard 60.

POLY-BORE Borehole Stabilizing Dry Polymer: Water-soluble, free-flowing, easy-mixing, 100% dry granular polymer that provides a clear solids-free, viscous, borehole stabilizing fluid for use in all types of trenchless construction applications. Certified to NSF/ANSI/CAN Standard 60.

QUIK-TROL GOLD Highly Dispersible Filtration Control Additive: A highly dispersible, polyanionic cellulosic (PAC) polymer, provides ease of mixing and improved filtration control in most water-based drilling fluids. When added to AQUAGEL®, QUIK-GEL®, QUIK-BORETM or BORE-GEL® slurry it can yield a low filtrate drilling fluid system suitable for drilling in water-sensitive formations. Certified to NSF/ANSI/CAN Standard 60.

QUIK-TROL GOLD LV Highly Dispersible Low Viscosity Filtration Control Additive: A highly dispersible polyanionic cellulosic (PAC) polymer that yields a low-filtrate drilling fluid system with manageable viscosity suitable for drilling in water-sensitive and unstable formations. Certified to NSF/ANSI/CAN Standard 60.

SODA ASH: Granular powder primarily used to treat out hardness due to calcium in makeup water, and to raise pH level.

Bentonite Performance Minerals, LLC, (281) 871-7900, bentonite.com

POLYSELECT POWER DET: Proprietary blend of surfactants that reduces stickiness of clay and shale, and bit balling.

POLYSELECT POWER PAC-L: Filtration control additive is designed to reduce the filtration rate of water-based fluids, while having minimal impact to viscosity. NSF/ ANSI/CAN Standard 60 certified.

POLYSELECT POWER PAC-R: Filtration control additive is designed to reduce the filtration rate of water-based fluids, while also increasing viscosity. Certified to NSF/ ANSI/CAN Standard 60.

POLYSELECT POWER SLURRY: Dry synthetic polymer used primarily to stabilize soils during drilled shaft and trench construction.

POLYSELECT POWER SODA ASH: Water conditioner is designed to reduce the

hardness and increase the pH of make-up water utilized for drilling fluids. Certified to NSF/ANSI/CAN Standard 60.

POLYSELECT POWER SWELL: Water swellable synthetic polymer designed to mitigate inadvertent returns and stabilize unconsolidated formations.

POLYSELECT POWER THIN: Phosphate-free drilling fluid thinner and dispersant that quickly acts to break up sticky clays and alter rheology. Certified to NSF/ANSI/ CAN Standard 60.

POLYSELECT POWER VIS: Liquid emulsion used primarily to encapsulate clay and shale to resist swelling and sloughing, and to increase lubricity and viscosity.

POLYSELECT POWER XAN: Biopolymer designed to increase suspension, while having minimal impact on viscosity.

CETCO, (800) 527-9948, cetco.com/dpg

ACCU-VIS: Liquid copolymer designed for fast field mixing, viscosity building, and clay/shale stabilization in aqueous drilling HDD fluids. Certified to NSF/ANSI/CAN Standard 60.

CETCO X-TORQUE: A 100-percent environmentally safe, non-petroleum lubricant specifically developed for HDD and mineral exploration, as well as other drilling applications. Can be used in bentonite systems or polymer drilling fluids.

CLAY CUTTER: Used on any size HDD bore to greatly reduce or eliminate clay cuttings from sticking to each other and to the drilling tools. Swelling of the bore will be reduced or eliminated; rotation and pullback pressures will be significantly reduced.

CLAY CUTTER PRO: Dry, concentrated, non-hazardous, proprietary clay inhibitor that can be used with either polymer or bentonite drilling fluid systems. An ideal additive for HDD bores in reactive clay soils and can be used in recycling systems.

DRILL-TERGE: Liquid solution of nonionic surfactant formulated to increase detergency and wetting properties of drilling fluids. Designed to work in fresh or saltwater to reduce torgue and drag.

HERCUL-EZ: Proprietary additive used in conjunction with bentonite-based drilling muds. With proper formulation, the system will produce a unique drilling fluid with excellent shear thinning characteristics. At low shear or at rest, the fluid will gel and allow for suspension of large cuttings yet thins immediately under pumping conditions. At rest, the fluid looks and behaves like a semi-solid but when sheared, even slightly, reverts back to a thin, almost water-like consistency. Certified to NSF/ ANSI/CAN Standard 60.

INSTA-VIS DRY: Highly concentrated, granular polymer ideal for sticky and swelling clays, and shale. Increases rate of penetration and stabilizes the borehole, while improving cohesion in sandy soil. Can be used in saltwater, such as tidal conditions.

INSTA-VIS LOW VISCOSITY: Easy-mixing, dry, water-soluble polymer used in horizontal and vertical drilling applications. Compatible with recycling equipment. Certified to NSF/ANSI/CAN Standard 60.

INSTA-VIS PLUS: Liquid polymer designed to improve drilling efficiency in both horizontal and vertical drilled holes through its rapid field mixing, viscosity development, and clay and shale inhibition. Can be used with VERSAFOAM PLUS to stiffen, and in brackish water. Certified to NSF/ANSI/CAN Standard 60.

MACRO-FILL: Granular, super-absorbent, solidification, and loss circulation material. Rapidly absorbs and retains large volumes of water from aqueous solutions, but only expands 1% in volume.

MAGMA FIBER: This specially formulated, extrusion spun mineral fiber and coarse, long flexible fiber will give increased circulation by bridging and plugging off voids, fractures, and all types of permeable formations. Certified to NSF/ANSI/CAN Standard 60.

PUREGOLD CLEANDRILL: For drilling operations where clay-based drilling fluids are restricted, and a biodegradable drilling fluid is recommended. Industry standard for use in horizontal and vertical remediation wells.

QUAD POWER POWER-BASE: Highly concentrated, liquid, polymer emulsion that serves as the base for QUAD POWER polymer drilling products. Used by itself, POWER-BASE will produce a high viscosity solution; in water it can fulfil the demands of most short bore length drilling applications. Certified to NSF/ANSI/CAN Standard 60.

Drilling Fluids Selection Guide

QUAD POWER POWER-CLAY: Concentrated, non-hazardous, proprietary clay inhibitor that can either be used with bentonite fluids or added to other QUAD POWER polymer drilling products. POWER-CLAY is an ideal additive for HDD bores in reactive clay soils.

QUAD POWER POWER-SAND: Highly concentrated liquid polymer that can either serve as a stand-alone fluid or be added to other QUAD POWER polymer drilling products. Use with POWER-BASE to increase solids suspension. POWER-SAND will produce a high-viscosity solution designed to suspend sand, silt and fine gravel. Contains a combination of proprietary lost circulation materials and can produce a thin filter-cake on the walls of a borehole, which can prevent fluid from flowing out into porous formations.

QUAD POWER POWER-TERGE: Highly concentrated liquid surfactant/detergent that can either be used with bentonite fluids or added to other QUAD POWER polymer drilling products. Used with bentonite, it will help prevent rod-sticking and seizing. When added to POWER-BASE, it can function to create an extremely high-performance slurry for clay drilling. Since it's highly concentrated, very little is used compared to most other detergents. Certified to NSF/ANSI/CAN Standard 60.

REL-PAC: Natural cellulosic, granular polymer designed for building a low-solids drilling fluid with increased stability. Forms a tight, thin filter cake that reduces fluid loss to the formation.

REL-PAC XTRA-LOW: Helps increase borehole stability by lowering filtrate and fluid loss more effectively than other polyanionic cellulose (PAC) polymers. Aids cleaning by not significantly raising viscosities and impeding flow. Helps control reactive formations by reducing available water, and controls unconsolidated formations by reducing whole fluid loss.

SHORE PAC: Easy-mixing, water-soluble, polymer supplied as a granular powder designed for preparation of viscous earth-reinforcing fluids or slurries in a variety of drilling applications. Certified to NSF/ANSI/CAN Standard 60.

SUPER PAC: Multi-purpose, liquid polymer designed for minimizing fluid loss to the formation. Enhances properties of bentonite drilling fluids and creates optimum drilling efficiency through filtration control.

SUPER PAC XTRA-LOW: Low-viscosity polymer that aids in the control of reactive and unconsolidated formations by reducing filtrate and whole fluid loss. Assists hole cleaning in HDD work and increases penetration rates in vertical wells by not significantly raising viscosities.

SUPER THIN: Highly concentrated additive engineered to reduce drilling fluid viscosity and assist in settling solids. It offers immediate thinning action, reduces gel strength and is more cost-effective than traditional thinners. Certified to NSF/ ANSI/CAN Standard 60.

SUSPEND-IT: Dry biopolymer used to increase suspension and removal of larger drilling cuttings, gravel and cobble in difficult formations. Enhances gel strength without significantly increasing viscosity.

Drilling Mud Direct LLC, (720) 489-0300, www.muddirect.net

Power VIS: Liquid polymer to help control clays, encapsulate clay cuttings; provides excellent bore lubricity for drilling and pipe pull.

DMD Lubra Star: Our most popular liquid additive, it reduces torque and friction, prevents sticking, lubricates many aspects of the bore, and is invaluable as an additive for pipe pull.

DMD Power PAC L/DMD Power PAC R: Dry, polyanionic-cellulose (PAC) polymer that improves filtrate/water-loss control and improves borehole stability. Available in "L" grade (viscosity neutral) and "R" grade (boosts viscosity).

DMD Power XAN: Premium-quality biopolymer used as a suspension enhancer and hole cleaning aid. Helps suspend cuttings, sand and gravel.

DMD Soda Ash: Boosts pH level of make-up water to improve bentonite mixing and performance.

Power DET: Drilling detergent formulated for HDD. Low foaming, it helps manage bit balling and prevents sticking tendencies of clay.

Power Swell: Plugging and sealing granular polymer that absorbs water to swell to 200 times its original particle size. Effective LCM for HDD.

Power Thin: Clay-thinning agent, mud thinner. A liquid that helps combat swelling clays and will also reduce the viscosity of a thick slurry. Helps manage clay problems.

M-I SWACO, (601) 649-1500, slb.com/hdd

DRILPLEX HDD: Specialty product used to enhance gel strengths of MAX GEL viscosifier. When added to bentonite, slurry produces high-fragile gels for superior suspension and carrying capacity of sand, gravel and rock cuttings from the borehole. Easy to pump, improves hole stability and reduces chances of loss circulation. Certified to NSF/ANSI/CAN 60.

DUO-VIS/SUPER-VIS: High-molecular-weight biopolymer used for increasing carrying capacity in water-based systems, and to increase low-shear viscosity for cuttings transport and suspension.

PLATINUM D-D: Aqueous blend of surface-active agents designed to reduce the surface tension of all water-based mud systems and reduce the sticking tendency of water-sensitive shale cuttings, which minimizes bit balling.

PLATINUM PAC: Premium, specially coated PAC designed for easy mixing without fish-eye formation. It provides filtration control and clay swelling inhibition in freshwater systems. Certified to NSF/ANSI/CAN 60.

PLATINUM PAC UL: This polyanionic cellulose (PAC) is a high-quality, readily dispersible, water-soluble polymer designed to control fluid loss. And, as an "ultra-low" (UL) additive, it causes minimal increase in viscosity in water-based muds. NSF certified. Certified to NSF/ANSI/CAN 60.

PLATINUM ROD EASE: Superior, environmentally friendly lubricant that reduces torque, corrosion and wear on equipment, while increasing ROP and overall rig potential.

POLYPAC R: This polyanionic cellulose is a high-quality, water-soluble polymer designed to control fluid loss and increase viscosity in water-based muds.

POLY-PLUS & POLY-PLUS 2000: Both PHPA polymers boost viscosity and lubricity and provide clay inhibition. POLY-PLUS 2000 is 52% active and will not separate under any conditions. Both polymers are certified to NSF/ANSI/CAN 60.

POLY-PLUS RD: Polymer product that is readily dispersed and designed to provide cuttings encapsulation and clay stabilization. Formulated for easy mixing with improved dispersion to eliminate "fish-eyes." This is beneficial when rapidly mixing either large quantities or high concentrations of polymer, where good mixing equipment is unavailable. Also acts as a viscosifier, friction reducer, and flocculant, providing some fluid-loss control. Certified to NSF/ANSI/CAN 60.

POLYSWELL: Unique, crosslinked polymer designed to swell many times its original weight when added to a drilling fluid. Its primary application is for lost circulation.

RINGFREE: Low-molecular-weight, liquid polymer designed to thin bentonite-based fluids. Also aids in breaking up sticky or swelling clays to help reduce torque and drag. Certified to NSF/ANSI/CAN 60.

Polymer Drilling Systems, (800) 243-7455, pdscoinc.com

Super Mud: Liquid polymer emulsion primarily used as a viscosifying agent and soil stabilizer to prevent sloughing and/or collapse of a borehole.

Super Mud Dry: Granular polymer used as viscosifier and soil stabilizer to prevent sloughing and/or collapse of borehole.

Wyo-Ben, Inc., (406) 652-6351, www.wyoben.com

Borzan: This true biopolymer is highly concentrated to minimize the cost per gallon. Its gel strengths suspend solids and prevent sticking, reducing loss circulation problems.

Claymaster: Concentrated, nonhazardous, proprietary clay inhibitor that can be used with either polymer or bentonite drilling fluid systems.

Drill-X HP: Low-foaming, drilling detergent and wetting agent used in freshwater systems. It also offers lubrication characteristics.

Drilling Fluids Selection Guide

Dril-Trol QD: Dry version of Uni-Drill, offering fluid loss control, moderate viscosity and superior clay inhibition.

Kwik-Vis "D": Premium PHPA polymer in a dry granular form. Designed to achieve high viscosities in shaft, caisson, horizontal drilling and slurry trenching operations, and in small drill applications.

Thinz-It: High-performance thinning agent for heavy clay applications. Can be used in conjunction with Drill-X to produce a unique "dispersed" mud system for better hole cleaning and faster penetration rates.

Uni-Drill: Proprietary liquid polymer designed for use in rotary and HDD operations. It mixes quickly and controls fluid loss, preventing the formation clays from swelling.

Wyo-Lube RR: Premium drilling fluid lubricant designed for HDD, rotary drilling and mining industries. Its superior lubricating properties decrease torque and drag, increase the penetration rate and reduce wear on tooling.

Wyo-Vis LVP: Powder polymer that shields clays from swelling during the boring operation, while adding limited viscosity to the mud system.

SOLIDIFICATION AGENTS

Baroid Industrial Drilling Products, (281) 871-4613, baroididp.com

BARASORB 955 Spent Slurry Solidification Agent: Dry, free-flowing, powder designed to gel spent drilling fluid and/or slurries to a consistency where the final material can be disposed of as "solid waste." When mixed at the recommended concentration, with a solids-laden slurry, BARASORB® 955 creates a gelled material within hours of application.

Bentonite Performance Minerals, LLC, (281) 871-7900, bentonite.com

BARA-KADE DWD: Dry, free-flowing powder designed to solidify spent drilling fluid and/or slurries to a consistency where the final material can be disposed of as solid waste. When mixed at the recommended concentration, with a solid laden slurry, BARA-KADE® DWD creates desired consistency within hours of application. Certified to NSF/ANSI/CAN Standard 60.

CETCO, (800) 527-9948, cetco.com/dpg

SLURRYBOND: Powdered, inorganic mineral formula used for the solidification of high-solids drilling slurries. Made from non-biodegradable mineral designed for use on waste slurry that fails to pass a Paint Filter Liquids Test (PFLT).

SLURRYBOND 200: Proprietary, solid, granular, super-absorbent polymer that rapidly absorbs and retains aqueous matter. Made from non-biodegradable polymer designed for use on waste slurry that fails to pass a Paint Filter Liquids Test (PFLT) or slump test.

SLURRYBOND 2000: Powdered, inorganic mineral and polymer formula used for the solidification of high-solids drilling slurries. Made from a non-biodegradable mineral and polymer mixture designed for use on waste slurry that fails to pass a Paint Filter Liquids Test (PFLT) or slump test.

SLURRYBOND 2000 G: Granular, inorganic mineral and polymer formula used for the solidification of high-solids drilling slurries. Made from a non-biodegradable mineral and polymer mixture designed for use on waste slurry that fails to pass a Paint Filter Liquids Test (PFLT) or slump test.

Drilling Mud Direct LLC, (720) 489-0300, www.muddirect.net

DWD Solidify: Effectively solidifies leftover slurry and cuttings. Allows for disposal via dump truck instead of vac truck, reducing overall volume to be disposed and disposal costs. Highly effective and now NSF approved. **UC**

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