ELEMENTIS

Energy Chemicals Product Guide

Going to Extremes

Unique chemistry, sustainable solutions

Contents

Get to know us better

Elementis is a global specialty chemicals company that collaborates closely with customers to create innovative solutions that are tailored to their needs and goals.

The Energy chemicals division of Elementis is a global supplier of high-performance additives to the oil services industries. We produce a variety of organically modified bentonite and hectorite clays, polymer-based additives, modified natural hectorite clay as well as aqueous defoamers that are used in drilling, stimulation, and cementing applications. Our focus is on products specifically tailored to meet the performance requirements, to withstand the challenging environments in the oil services industry and to the development of enabling technology to break barriers.

Since 1949 Elementis has been a trusted partner in the oilfield chemicals industry with rheological additives that thicken and suspend solids. These products are sold under the BENTONE® and THIXATROL® trade names and are recognized worldwide as the leading performance rheological additives in the industry.

The **BENTONE®** product line includes both bentonite and hectorite clay bases and provides a range of products from highly effective standard grades to highly processed, uniquely modified grades for optimum dispersibility, efficiency and stability in a variety of base oil systems.

The **THIXATROL®** product line offers polymeric additives for offshore and on land applications. Some THIXATROL® products are designed to minimize ECD changes due to extreme temperatures variations in deep water drilling and others build low shear rate rheology to reduce sag in long horizontal wells.

The **BENAQUA®** product line is designed for water-based drilling and cementing applications. The BENAQUA® product line includes modified hectorite blends and polymers designed for efficiency in HTHP conditions.

The **DAPRO®** line of defoamers offer a broad range of mineral oil, polysiloxane, and polymeric defoamers. The **DUMACIL®** line compliments the products with dry defoamers.

High purity, beneficiated hectorite based rheological additives are unique to Elementis. Our mine in Hector, California, yields a white clay of unique chemistry and physical characteristics. The organoclays derived from our hectorite are highly efficient and stable in a variety of difficult drilling conditions. Elementis hectorite based organoclays are recognized by the industry as the most reliable organoclays for high temperature environments.

Hectorite Mine, Newberry Springs, California USA

Organoclay Rheological Additives

Oil Based Drilling

Product Features Summary

Trade Name	Drilling Application	Product Characteristics	Base Fluid					Attributes			
			Diesel Oil	Mineral Oil	Synthetic Oil	Ester and Vegetable Oil	All-Oil	Ease of Incorporation	Efficiency	HTHP Stability	Cold Temp. Incorporation
BENTONE® 38	High Temperature	Premium hectorite based organoclay with broadest applicability. Highly resistant to incursion from contaminants. Extends practical temperature range by 50°F - 100°F beyond bentonite clays.	•	•	•	○				•	
BENTONE® 42	High Temperature	Hectorite organoclay optimized for synthetic base oil systems for bottom hole temperatures beyond the range of BENTONE® 38.	•	•	•					•	
BENTONE® 150	Rapid Dispersion & All-Oil Systems	Combines exceptionally rapid dispersibility with high efficiency and low shear suspension characteristics. Particularly well suited for use in all-oil systems.	•	•	•		•	•	•		•
BENTONE® 155	High Efficiency Invert	Combines exceptionally rapid dispersibility with high efficiency and low shear suspension characteristics. Particularly well suited for use in invert emulsions. An ideal additive for mud plants having low shear mixing equipment.	•	•	•			•	•		
BENTONE® 128	Flat Gels	An easy dispersing, fast yielding viscosifier, which yields effectively at reduced shear and low temperature. Minimizes development of progressive gels.	•	•	•		○				•
BENTONE® 34	General Purpose and Economics	The original organoclay for oil-based fluids. It has been used in drilling fluids worldwide for over 40 years.	•	•	•						
BENTONE® 910	General Purpose and Economics	BENTONE® 910 incorporates reliability and effectiveness as a premium economy viscosifier that has become a standard for the industry.	•	○							
BENGEL® 62	General Purpose and Economics	BENGEL® 62 is a cost effective organo bentonite viscosifier for oil-based invert drilling fluids.	•	○							
BENGEL® 62E	General Purpose and Economics	BENGEL® 62E is a cost effective organo bentonite viscosifier for oil-based invert drilling fluids.	•	○							
BENTONE® 920	General Purpose and Economics	BENTONE® 920 is preferred in applications requiring a more robust economy viscosifier. It combines improved dispersibility with enhanced efficiency.	•	•	•						•
BENGEL® 65	General Purpose and Economics	BENGEL® 65 is a cost effective organo bentonite viscosifier for oil-based invert drilling fluids.		•	•						•
BENTONE® 990	Improved Suspension	BENTONE® 990 is an amine treated attapulgite suspension additive that improves carrying capacity, suspension of oil-based invert drilling fluid under HTHP conditions.	•	•	•	○				•	

• Recommended ○ Can be used

Polymerics

Oil Based Drilling

Product Features Summary

Trade Name	Drilling Application	Product Characteristics	Base Fluid				Attributes				
			Diesel Oil	Mineral Oil	Synthetic Oil	All-Oil	LSRR & Sag Control	ECD Control	Efficiency	HTHP Stability	Clay Free Systems
THIXATROL® DW 50	Rheology Deep Water Drilling Fluids	A second-generation polymeric rheological additive for deep water drilling fluids. This polymer offers improved thermal stability to 350°F, while maintaining ECD control, constant LSRV between 40°F through 350°F and 35% lower HSRV at 40°F as compared to muds built with conventional RAs.	•	•	•	○	○	•	•	•	○
THIXATROL® DW 100	Rheology Land and Offshore OBM Drilling Fluids	A biodegradable polymeric RA targeted for cost sensitive land and deep-water offshore operations. This polymer is thermally stable through 350°F and reduces ECD increases caused by mud cooling by generating a flat rheological profile with respect to reduced temperatures. Additionally, DW100 generates a flatter rheological profile with respect to shear rate (reduced PV for a given YP) for an increase in ROP. Yellow rating North Sea.	•	•	•	○	○	•	•	•	○
THIXATROL® RM 14	Rheology LSRRM Land and Offshore Drilling Fluids	A universal rheology modifier that increases low shear rate rheology in OBMs without increasing high shear rate viscosity. Improves anti sag properties for deviated wells. Fragile gels in combination with reduced PV for a given YP minimizes increases in ECD for improved control of downhole pressure and mud losses to the formation.	•	•	•	•	•	•	•	•	•
THIXATROL® Plus or Max	Suspension	Unique polymeric heat activated rheological additives designed to develop a high level of thixotropy in organic fluids. They function in a variety of different solvents. Products are in dry form.	•	•	•						

• Recommended ○ Can be used

Aqueous Additives

Water Based Drilling Rheology

Trade name	Drilling Application	Product Characteristics
BENAQUA® 1101	Water-based HTHP Rheology	Specialty beneficiated hectorite clay for use in Mixed Metal Hydroxide systems and in freshwater HTHP applications. Significantly extends the system temperature stability and salt tolerance compared to bentonite clays.
BENAQUA® 1210	Water-based HTHP Rheology low Sag	Specialty beneficiated mixed mineral clay for use in Mixed Metal Hydroxide systems and in freshwater HTHP appications. Significantly extends the system temperature stability and salt tolerance compared to bentonite clays. Formulated to reduce sag.
BENAQUA® 1155	Water-based fluid loss and weighting additive	Travertine blend with hectorite to provide easy dispersion for fluid loss, loss circulation and as a weighting additive for water-based drilling fluids

Defoamers for Drilling & Cementing

Trade Name	Description
Dapro® DF 18 S	Blend of hydrophobic silica and petroleum oil
Dapro® DF 300	Blend of metallic salt, polymeric derivatives, emulsifiers, and petroleum oil
Dapro® DF 503	Blend of metallic salt, polymeric derivatives, emulsifiers, and mineral oil
Dapro® DF 52	Blend of esters, hydrophobic silica, and emulsifiers
Dapro® DF 604	Silicone emulsion
Dapro® DF 609	Emulsion of polysiloxanes and organomodifed polysiloxanes
Dapro® DF 620	Silicone blend
Dapro® DF 649	Modified polysiloxanes and glycol blend
Dumacil® 402	Hydrophobic silica (powder form)

Well Services

Cementing
Typical Properties

Trade Name	Application	Product Characteristics	Composition	Moisture % Max	Density
BENAQUA® 1101	Rheology and Suspension	BENAQUA® 1101 thickens, forms gels and suspends solids in aqueous systems. It provides reproducible thixotropic viscosity and eliminates hard settling of solids more efficiently than bentonite clays.	Modified hectorite clay	10	2.65 g/cm^3
BENAQUA® 1210	Rheology and Suspension	BENAQUA® 1210 thickens, forms gels and suspends solids in aqueous systems. It provides reproducible thixotropic viscosity with superior mitigation of hard settling compared to bentonite clays.	Mixed mineral	10	2.60 g/cm^3
BENAQUA® 1155	Rheology, filler, and bridging material	BENAQUA® 1155 is specialty blend of travertine and hectorite formulated to function as a filler on cement, a non-reactive bridging material for geo-polymers while providing a base rheology component.	Travertine & hectoite blend	10	2.50 g/cm^3

Stimulation - Hydraulic Fracturing Additives
Product Features Summary

Trade Name	Application	Product Characteristics	Base Fluid					Attributes			
			Diesel Oil	Mineral Oil	Synthetic Oil	Ester and Vegetable Oil	Glycol Ether	Cold Temp. Incorporation	Low Shear Incorp.	High Yield	Improve Suspension
BENTONE® 150	Suspension of Water-Soluble Polymers	A highly efficient organoclay designed to provide superior suspension of water-soluble polymer in low temperature environments and with low shear mixing.	•	•	•			•	•	•	
BENTONE® 155	Suspension of Water-Soluble Polymers	High yield organoclay that provides superior suspension and consistent performance of water soluble polymers properties under low shear mixing.	•	•	•				•	•	
BENTONE® 27 or BENTONE SD®-2	Suspension of Water-Soluble Polymers	Organoclay designed for use with esters and polar base fluids, including glycol ethers.				•	•	○			
BENTONE® 990	Suspension of Water-Soluble Polymers	BENTONE® 990 is an amine treated attapulgite suspension additive that improves carrying capacity, suspension of oil-based slurries.	•	•	•	○	○				•
NUOSPERSE® FN 211	Suspension of Water-Soluble Polymers	NUOSPERSE® FN 211 is an environmentally friendly, low foam, non-ionic surfactant used to stabilize guar and other slurries. Exhibits low pour point < -20C	•	•	•	○		•	•		•

• Recommended ○ Can be used

NOTE:

The information herein is currently believed to be accurate. We do not guarantee its accuracy. Purchasers shall not rely on statements herein when purchasing any products. Purchasers should make their own investigations to determine if such products are suitable for a particular use. The products discussed are sold without warranty, express or implied, including a warranty of merchantability and fitness for use. Purchasers will be subject to a separate agreement which will not incorporate this document.

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