

# Freebee Bentonite Drilling Fluids

Range of Freebee Bentonite products offer distinct advantages for horizontal directional drilling, micro tunneling, oil and hydrogeological drilling due to its composition, rheological parameters and high quality of composites



# Advantages that works for you

Bentonites from Freebee offer distinct advantages due to its composition and very high quality



## Freebee Bentonite types

1. Bentonite Gel API – tunneling and civil engineering.
2. Bentonite HDD Gel TEQ – horizontal directional drilling, micro tunneling jobs and civil engineering.
3. Bentonite HDD Gel BORE – horizontal directional drilling, oil and water drilling, micro tunneling.
4. Bentonite KABEL - power lines installed in casings.

## BACKGROUND AND APPLICATION

Bentonite is a clay firstly found in 1890 in Wyoming, USA. It consists mainly of montmorillonite – a soft mineral from phyllosilicate group.

There are different bentonite applications regarding to the bentonite type, potassium (K), sodium (Na), calcium (Ca), and aluminium (Al).

The one used in drilling is sodium bentonite. Due to its viscosity and plasticity, it is applied in tunnelling, in horizontal directional drilling and pipe jacking.

Physical properties of sodium bentonite allow to seal the borehole walls, to remove drill cuttings and to lubricate the cutting head.

## OVERVIEW

Most of our bentonites are activated one sack systems. They are specifically composed with the concentration of different minerals from various deposits. This concentration is modified and mixed in the definite

proportion, with the further treatment with chemical reagents including polymerization.



Bentonite HDD Gel TEQ

The bentonite types we offer are suitable for almost all types of drilling and tunneling jobs. While **Gel API** bentonite is the most universal solution suitable for different operations, **HDD Gel TEQ** and **HDD Gel BORE** bentonite systems are premium "all-in-one-bag" solutions specifically developed for the horizontal directional drilling operations. Their unique composition allows to decrease the bentonite consumption on **10-15 %** in average in comparison with other bentonite brands.



## Production

We produce our bentonite in Poland using the highest-quality clay from Slovakia.

## BENTONITE GEL API

FREEBEE BENTONITE GEL API is a high-quality drilling bentonite for use in drilling and microtunneling jobs. Economical product works effectively at low concentrations. Rheological parameters ensure the safe conduct of work under all geological conditions.

Application:

- ✓ Oilfield, Microtunneling, Tunneling and Civil Engineering,
- ✓ The basic component of drilling system with a low solid content
- ✓ Universal fluid for drilling large-diameter vertical
- ✓ Bentonite suspension provides a stable borehole
- ✓ Provides effective lubrication in the microtunneling technology

Advantages:

1. Low coefficient of friction in the hole;
2. Creating a stable gel structures;
3. Easy to clean in shale shakers and hydrocyclones.

## BENTONITE HDD GEL TEQ

FREEBEE TEQ bentonite is used in horizontal directional drilling, micro tunneling jobs and civil engineering application. Product provides good drilling fluid parameters in acceptable concentration, in high calcium level environment. FREEBEE TEQ minimizes drilling problems, provides cement slurry stability and helps reduce torque and drag in long horizontal wells. Product is non-toxic and environmentally safe.

The main competitive advantage of TEQ in comparison with other bentonite brands is high rheological parameters.

Application:

- ✓ Horizontal Directional Drilling, Oilfield, Microtunneling, Civil Engineering;
- ✓ Effective component for drilling fluids in loose gravel formation;
- ✓ Bentonite suspension for cement slurries;
- ✓ Lost circulation slurry component;

- ✓ Effective viscosifier and water loss controller;
- ✓ Component of lubrication systems.

Advantages:

1. High resistance for calcium environment;
2. Effective viscosifier and stabilizer in low consolidate, porous formation;
3. Low water loss level;
4. Excellent carrying capacities at low annular velocities;
5. Provides effective lubricity.



Bentonite drilling fluid

Rheological parameters of Gel TEQ, laboratory mixer, 1500 ± 100 rev/min

Rev/min	20 kg/m <sup>3</sup>	25 kg/m <sup>3</sup>	30 kg/m <sup>3</sup>
600	41,4	65,1	86,1
300	29,6	48,4	67,2
200	24,5	40,2	59,5
100	18,1	30,8	45,7
60	14,4	25,3	38,4
30	11,0	19,7	31,0
6	6,2	12,3	20,1
3	4,9	10,1	17,1
PV [cP]	11,8	16,7	18,9
YP [lbs /100ft <sup>2</sup> ]	17,8	31,7	48,3
Gels [lbs /100ft <sup>2</sup> ]	6,0/12,5	10,2/18,5	15,2/30,8

PV – plastic viscosity

YP – yield point

The before mentioned data meet the present state of our knowledge and experience. For specific instructions refer to the MSDS information.

## BENTONITE HDD GEL BORE

FREEBEE BORE is a special bentonite for use in horizontal directional drilling, oil and water drilling, microtunneling and other geoenvironmental application. FREEBEE BORE provides good drilling fluid parameters in low concentration, therefore is ideal for drilling operation. FREEBEE BORE minimizes drilling problems, provides wellbore stability, water loss control and helps reduce torque and drag in long horizontal wells. Product is non-toxic and environmentally safe.

Application:

- ✓ Horizontal Directional Drilling, Oilfield, Microtunneling, Water Well Drilling, Mineral Exploration Holes, Slurry Walls Technology;
- ✓ Low solids content drilling fluid;
- ✓ High rheological parameters for effective cutting transport and hole cleaning;
- ✓ Viscosifier and water loss control;
- ✓ Lubrication systems.

Advantages:

1. High rate of drilling penetration
2. Effective viscosifier and stabilizer in low consolidated, porous formation;
3. Fragile, non-progressive gel strength;
4. Minimizes drilling problems such: stuck pipe, mud losses and drag in the hole;
5. Low water loss level;
6. Excellent carrying capacities at low annular velocities;
7. Low pressure drops in drilling systems;
8. Low torque and drag in long horizontal wellbores;
9. Provides lubricity and stability in water sensitive formation;
10. High thermal stability;
11. Compatible with wide range drilling polymers;
12. Dispersed easily with high shear;
13. Easy to clean in shale shakers and hydrocyclones.

Bentonite Gel HDD Bore has much better rheological parameters than analogues from the other producers.

## Rheorheological parameters comparison of Freebee Bentonite Gel HDD Bore and Baroid Tunnel-Gel Plus

Fresh water 20 °C,  
12 speed Fann rheometer  
Mixer: Hamilton Beach

Rev/min	30 kg/m <sup>3</sup>		
	Freebee Bentonite HDD Gel Bore	Competitor 1	Competitor 2
600	44,6	39,5	41,8
300	35,7	28,8	29,5
200	31,4	24,3	24,2
100	27,1	20,6	21,6
60	23,5	18,7	19,8
30	19,6	16,1	17,7
6	16,8	13,4	14,0
3	15,3	12,2	11,6
PV [cP]	8,9	10,7	12,3
YP [lbs /100 ft <sup>2</sup> ]	26,8	18,1	17,2

PV – plastic viscosity

YP – yield point

The before mentioned data meet the present state of our knowledge and experience. For specific instructions refer to the MSDS information.

## BENTONITE KABEL

Application:

Freebee Bentonite KABEL is a high performance, heat conducting bentonite product, designed for power lines installed in casings. Outstanding low thermal resistance of Freebee Bentonite KABEL provides heat dissipation in power line's closest environment reducing capacity loss in the cable line. The power capability of the cable run is permanently increased.

Freebee Bentonite KABEL improves heat dissipation for cables in range of: Medium Voltage (1-33 kV), High Voltage (110-138 kV), Extra High Voltage (230-800 kV), as well as Ultra High Voltage (higher than 800 kV). The Product is recommended for all range of casing type installation, where cable is installed inside

the pipeline. Freebee Bentonite KABEL simulates the normal ground conditions – its thermal resistance is designed to correspond with moisture soil in situ.

Advantages:

1. provides heat dissipation from electricity cables installed in casing
2. low thermal resistivity in at 0.75-0.8 K·m/W
3. thermal resistivity better than air, water, bentonite mud and others,
4. keeps cables in a fixed position inside in the casing,
5. provides even contact between a casing wall and a power cable,
6. easy to mix and pump, continuous agitators can be used for automatic grout preparation (jet grouting)
7. suspension keep the parameters endless
8. easy and cost efficient at power cable displacement



### Contact us today

Our team of experts is looking forward to provide you with further specifications and pricing.

*August 2016. The information in this folder is subject to change.*