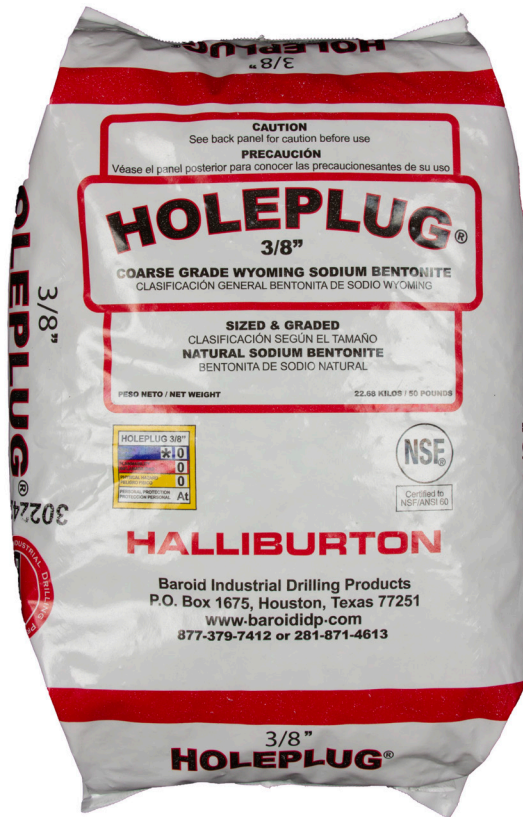




BAROID HOLEPLUG®

Graded Sodium Bentonite



Description HOLEPLUG® naturally occurring Wyoming sodium bentonite clay is a sized and graded chip material used to seal and plug earthen boreholes.

HOLEPLUG bentonite is available in two particle size grades:

- HOLEPLUG® 3/4" bentonite (100% of particles pass through 3/4" screen; all particles retained on 3/8" screen)
- HOLEPLUG® 3/8" bentonite (100% of particles pass through 3/8" screen; all particles retained on 1/4" screen)

Applications/Functions The use of HOLEPLUG sodium bentonite assists or promotes the following:

- Grouting annulus in all types of wells, particularly environmental monitoring well applications
- Sealing above gravel packs
- Plugging decommissioned boreholes
- Stemming shotholes
- Sealing around conductor pipe
- Sealing lost circulation zones
- Shutting off artesian flow

Advantages

- Helps prevent entry of surface water into boreholes
- High swelling potential
- In situ swelling to provide a superior seal with excellent casing stabilization
- Easier to apply than pellets
- Cost effective
- Simple to apply, mixing not required
- Helps prevent vertical movement of fluids in the hole between porous zones
- Helps form a permanent, flexible downhole seal
- Helps allow hole re-entry
- Rehydratable
- NSF/ANSI Standard 60 certified

Typical Properties

Volume of 50-lb (22.7 kg) sack	
HOLEPLUG 3/4" bentonite	0.73 ft ³ or 0.027 yd ³ or 0.021 m ³
HOLEPLUG 3/8" bentonite	0.70 ft ³ or 0.026 yd ³ or 0.020 m ³
Permeability	1.5 x 10 ⁻⁹ cm/sec (in fresh water)
Appearance	Beige to tan chips

Recommended Treatment

Plugging and Stemming Drill Holes

Due to shipping and handling, a small amount of fine bentonite particles may be present. For optimum results, HOLEPLUG® should be poured over a mesh or screen with ¼" (6.4 mm) openings to "sift out" the smaller particles. The screen should be large enough (approx. 1 yd² or 1m²) to be folded into a "V" shape to allow sifting while the product is being poured into the hole. Also, HOLEPLUG bentonite should be poured slowly. Allow approximately two minutes to pour a 50-lb (22.7 kg) bag.

1. Position the screen with the lower end placed over the borehole
2. Slowly pour HOLEPLUG bentonite down the "V" so that fine particles fall through the screen before the larger particles fall into the borehole
3. Fill hole as required (above static water level or to ground level)
4. Observe all regulatory specifications

Stopping loss of circulation and stabilizing unconsolidated formations

1. Pull drill pipe out of hole
2. Pour HOLEPLUG bentonite into hole to fill above problem zone
3. Drill ahead slowly with reduced pump pressure

Plugging flowing wells

Pour HOLEPLUG bentonite into hole until water flow subsides or hole is filled to surface.

guidelines.

- The subsurface environment that the respective bentonite sealing material or grout is to be placed into should always be taken into consideration when selecting the appropriate material to compose the well seal. If the formation water chemistry has a total hardness of greater than or equal to 500 parts per million and/or a chloride content of greater than or equal to 1500 parts per million the use of a bentonite material may not be appropriate for this environment. In the event that questions regarding subsurface environments arise it is always best to consult your local Baroid IDP representative to determine if the Baroid product of choice is appropriate for the given conditions.
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Application Amounts

Amounts of HOLEPLUG®* Graded Sodium Bentonite Required for Plugging Applications				
Hole Diameter (inches)	Hole Volume (ft ³ /ft)	Pounds HOLEPLUG bentonite Needed to Fill One Foot	Feet Filled by One Bag HOLEPLUG bentonite	Bags HOLEPLUG bentonite Needed to Fill 100 ft
2	0.022	1.6	32.6	3.2
2.5	0.034	2.4	20.5	5.0
3	0.049	3.5	14.3	7.0
3.5	0.067	4.8	10.4	9.6
4	0.087	6.3	7.9	12.6
4.5	0.110	7.9	6.3	15.8
5	0.136	9.8	5.1	19.6
5.5	0.165	11.9	4.2	23.8
6	0.196	14.1	3.5	28.2
6.5	0.230	16.6	3.0	33.2
7	0.267	19.2	2.6	38.4
7.5	0.307	22.1	2.3	44.2
8	0.349	25.1	2.0	50.2
8.5	0.394	28.4	1.8	56.8
9	0.442	31.8	1.6	63.6
9.5	0.492	35.4	1.4	70.8
10	0.545	39.2	1.3	78.4
11	0.660	47.5	1.1	95.0
12	0.785	56.5	0.89	113.0
15	1.227	88.3	0.57	176.6
18	1.767	127.2	0.39	254.4
20	2.182	157.1	0.32	314.2
25	3.409	245.4	0.20	490.8
30	4.909	353.4	0.14	706.8

**The above calculations and resultant volumes of material required assume a gauge bore hole and are based on the use of HOLEPLUG 3/8" sodium bentonite where the average bulk density per bag is 0.7 ft³/50-lb bag. Required material volumes for HOLEPLUG 3/4" will differ slightly for the same size bore hole. In the event that questions arise or further information is needed, please contact your local Baroid IDP Representative for assistance*

Application Amounts (metric equivalents)

Amounts of HOLEPLUG®* Graded Sodium Bentonite Required for Plugging Applications				
Hole Diameter (mm)	Hole Volume (m ³ /m)	Kilograms HOLEPLUG bentonite Needed to Fill One Meter	Meters Filled by One Bag HOLEPLUG bentonite	Bags HOLEPLUG bentonite Needed to Fill 10 meters
51	0.002	2.3	9.87	1.0
64	0.003	3.6	6.31	1.6
76	0.005	5.2	4.38	2.3
89	0.006	7.0	3.22	3.1
102	0.008	9.2	2.47	4.1
114	0.010	11.6	1.95	5.1
127	0.013	14.4	1.58	6.3
140	0.015	17.4	1.30	7.7
152	0.018	20.7	1.10	9.1
165	0.021	24.3	0.93	10.7
178	0.025	28.2	0.81	12.4
191	0.029	32.4	0.70	14.3
203	0.032	36.8	0.62	16.2
216	0.037	41.6	0.55	18.2
229	0.041	46.6	0.49	20.5
241	0.046	51.9	0.44	22.9
254	0.051	57.5	0.39	25.3
279	0.061	69.6	0.33	30.7
305	0.073	82.8	0.27	36.5
381	0.114	129.4	0.18	57.0
457	0.164	186.4	0.12	82.1
508	0.203	230.1	0.10	101.4
635	0.317	359.5	0.06	158.4
762	0.456	517.7	0.04	228.1

**The above calculations and resultant volumes of material required assume a gauge bore hole and are based on the use of HOLEPLUG 3/8" sodium bentonite where the average bulk density per bag is 0.020 m³/22.7-kg bag. Required material volumes for HOLEPLUG 3/4" will differ slightly for the same size bore hole. In the event that questions arise or further information is needed, please contact your local Baroid IDP Representative for assistance.*

Packaging HOLEPLUG graded bentonite is packaged in 50-lb (22.7 kg) multiwall paper bags.

Availability HOLEPLUG graded sodium bentonite can be purchased through any Baroid Industrial Drilling Products Retailer. To locate the Baroid IDP retailer nearest you contact the Customer Service Department in Houston or your area IDP Sales Representative.