BAROID® BENTONITE PELLETS

Sealing and Plugging Material

Description

BAROID® BENTONITE PELLETS sealing and plugging material are compressed, shaped pellets of high-swelling, untreated sodium bentonite. BAROID BENTONITE PELLETS are available in three sizes: 1/4", 3/8", and 1/2".

Applications/Functions

The use of BAROID BENTONITE PELLETS sealing and plugging material assists and promotes the following:

- Seal or grout plastic or steel casing
- Isolate screen intervals, subsurface instrumentation, and sampling zones
- Provide a protective interface between gravel pack and cement grout
- Plug abandoned earthen boreholes and cavities
- Create a stable, permanent, low permeability below-grade seal in:
  - monitor/observation wells
  - dewatering holes
  - caisson holes
  - soil sampling holes
  - mineral exploration holes
  - water wells

Advantages

- High swelling capacity in the presence of fresh water
- No heat of hydration
- Re-hydratable
- After hydration, forms a semi-solid, flexible seal with permeability less than 1 x 10^{-8} cm/sec
- NSF/ANSI standard 60 certified

Typical Properties

Appearance	Pre-formed tablet shapes, tan to gray in color		
Slurry pH (6%)	8.8		
Specific gravity	2.6		
Bulk density, lb/ft^3	1/4"	3/8"	1/2"
(as packaged)	72	70	69

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Recommended Treatment

1. Calculate the amount of BAROID® BENTONITE PELLETS sealing and plugging material required from the chart below.
2. Pour pellets slowly from the surface to minimize bridging. Pellets can be tremied into place when necessary.
3. Calculate and monitor pellet addition amounts to ensure proper hole fill by measuring the position of the top of the plug after every few pails. Break up bridges as they occur.
4. Calculated volume should be applied to borehole.

Volume/Amount of BAROID® BENTONITE PELLETS Required For Grouting and Plugging Applications					
Nominal Size (inches)	Hole Volume, ft^3/ft	□al/ft	Pounds of PELLETS needed to fill 1 ft		
			1/4"	3/8"	1/2"
3	0.049	0.37	3.5	3.4	3.4
4	0.087	0.65	6.3	6.1	6.0
4.5	0.110	0.83	7.9	7.7	7.6
5	0.136	1.02	9.8	9.5	9.4
5.5	0.165	1.23	11.9	11.5	11.4
6	0.196	1.47	14.1	13.7	13.5
7	0.267	2.00	19.2	18.7	18.4
7.5	0.307	2.30	22.1	21.5	21.2
7.875	0.338	2.53	24.3	23.7	23.3
8	0.349	2.62	25.1	24.4	24.1
8.5	0.394	2.95	28.4	27.6	27.2
8.75	0.417	3.12	30.1	29.2	28.8
10	0.545	4.10	39.3	38.2	37.6
11	0.660	4.94	47.5	46.2	45.5
11.5	0.721	5.40	51.9	50.5	49.8
12	0.785	5.88	56.5	55.0	54.2
12.25	0.818	6.12	58.9	57.3	56.5
12.5	0.852	6.37	61.3	59.6	58.8
12.75	0.886	6.63	63.8	62.0	61.2
17.25	1.623	12.14	116.8	113.6	111.9
17.5	1.670	12.49	120.2	116.9	115.2
24	3.141	23.49	226.1	219.8	216.7
26	3.686	27.60	265.4	258.0	254.3
30	4.907	36.70	353.3	343.5	338.6
36	7.066	52.85	508.8	494.6	487.6

Recommended Treatment (Metric Equivalents)

1. Calculate the amount BAROID® BENTONITE PELLETS sealing and plugging material required from the chart below.
2. Pour pellets slowly from the surface to minimize bridging. Pellets can be tremied into place when necessary.
3. Calculate and monitor pellet addition amounts to ensure proper hole fill by measuring the position of the top of the plug after every few pails. Break up bridges as they occur.
4. Calculated volume should be applied to borehole.

Volume/Amount of BAROID® BENTONITE PELLETS Required For Grouting and Plugging Applications

Nominal Size (mm)	Hole Volume, m^3/meter	Liter/meter	Kilograms of PELLETS needed to fill 1 meter		
			1/4"	3/8"	1/2"
76	0.005	4.6	5.2	5.1	5.0
102	0.008	8.1	9.4	9.2	9.0
114	0.010	10.3	11.8	11.4	11.3
127	0.013	12.7	14.6	14.2	14.0
140	0.015	15.3	17.8	17.3	17.0
152	0.018	18.2	20.9	20.3	20.1
178	0.025	24.8	28.7	27.9	27.5
191	0.029	28.5	33.0	32.1	31.7
200	0.031	31.4	36.2	35.2	34.7
203	0.032	32.4	37.3	36.3	35.8
216	0.037	36.6	42.3	41.1	40.5
222	0.039	38.8	44.6	43.4	42.8
254	0.051	50.7	58.4	56.8	56.0
279	0.061	61.3	70.5	68.5	67.6
292	0.067	67.0	77.2	75.1	74.0
305	0.073	73.0	84.3	81.9	80.7
311	0.076	76.1	87.6	85.2	84.0
318	0.079	79.2	91.6	89.0	87.8
324	0.082	82.4	95.1	92.4	91.1
438	0.151	150.8	173.8	168.9	166.5
445	0.155	155.2	179.4	174.4	171.9
610	0.292	291.9	337.0	327.7	323.0
660	0.343	342.6	394.5	383.6	378.1
762	0.456	456.1	525.9	511.3	504.0
914	0.657	656.8	756.6	735.6	725.1

Note:

- If less than calculated volume is used, this indicates bridging or hole collapse. If more than calculated volume is used, this indicates hole washout (enlargement).

Note:

- To calculate the volume of material needed for filling annular space between casing and hole wall:

  Volume needed = (volume of drilled hole) – (volume casing OD)

  1. Subtract the volume needed to fill the nominal casing O.D. from the volume needed to fill the nominal drilled hole size.
  2. Use the preceding table(s) to obtain volumes for use in the formula above.

  Example:
  5-inch (127 mm) casing in an 8 3/4" (~222 mm) drilled hole, and using 1/4" pellets
  Volume needed = (volume of drilled hole) - (volume casing O.D.)
  30.1 lb - 9.8 lb = 20.3 lb to fill 1 foot of annular space
  44.6 kg – 14.6 kg = 30.0 kg to fill 1 meter of annular space

Note:

- Bentonite may not be the appropriate sealing material where 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. 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.

Packaging

BAROID® BENTONITE PELLETS are packaged in 5-gal (19-liter) plastic pails containing 50-lbs (22.7 kg). One container of product will occupy approximately 0.7 ft^3.

Availability

BAROID BENTONITE PELLETS 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.

Baroid Industrial Drilling Products
Product Service Line, Halliburton
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Houston, TX 77032

Customer Service	**(800) 735-6075 Toll Free**	**(281) 871-4612**
Technical Service	**(877) 379-7412 Toll Free**	**(281) 871-4613**