BAROID® BENTONITE PELLETS

Sealing and Plugging Material

Description

BAROID BENTONITE PELLETS are compressed, shaped pellets of high-yielding, untreated Wyoming bentonite.
BAROID BENTONITE PELLETS are available in three sizes: 1/4", 3/8", and 1/2".

Applications/Functions

- 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 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

Typical Properties

Appearance	Pre-formed tablet shapes, gray in color		
Mineralogical component	85% sodium montmorillonite clay		
Slurry pH (6%)	8.8		
Specific gravity	2.6		
Bulk density, lb/ft^3	1/4"	3/8"	1/2"
(as packaged)	71	71	67

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Recommended Treatment

1. Pour pellets slowly from surface to minimize bridging of pellets. Break up bridges as they occur.
2. Pellets can be tremied into place when necessary. Volume needed can vary by as much as 10 to 15 percent in a rotary drilled hole.
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.
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	gal/ft	Pounds of PELLETS needed to fill 1 ft		
			1/4"	3/8"	1/2"
3	0.049	0.37	3.5	3.5	3.3
4	0.087	0.65	6.2	6.2	5.9
4.5	0.110	0.83	7.8	7.8	7.4
5	0.136	1.02	9.7	9.6	9.2
5.5	0.165	1.23	11.7	11.6	11.1
6	0.196	1.47	13.9	13.8	13.2
7	0.267	2.00	19.0	18.8	18.0
7.5	0.307	2.30	21.8	21.6	20.6
7.875	0.338	2.53	24.0	23.8	22.7
8	0.349	2.62	24.8	24.6	23.4
8.5	0.394	2.95	28.0	27.7	26.4
8.75	0.417	3.12	29.7	29.4	28.0
10	0.545	4.10	38.7	38.4	36.5
11	0.660	4.94	46.9	46.5	44.3
11.5	0.721	5.40	51.2	50.8	48.4
12	0.785	5.88	55.8	55.3	52.6
12.25	0.818	6.12	58.1	57.6	54.8
12.5	0.852	6.37	60.5	60.0	57.1
12.75	0.886	6.63	62.9	62.4	59.4
17.25	1.623	12.14	115.23	114.3	108.7
17.5	1.670	12.49	118.6	117.6	111.9
24	3.141	23.49	223.1	221.2	210.5
26	3.686	27.60	261.8	259.6	247.1
30	4.907	36.70	348.5	345.6	328.9
36	7.066	52.85	501.9	497.6	473.6

Recommended Treatment (Metric Equivalents)

1. Pour pellets slowly from surface to minimize bridging of pellets. Break up bridges as they occur.
2. Pellets can be tremied into place when necessary. Volume needed can vary by as much as 10 to 15 percent in a rotary drilled hole.
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.
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	7.4	7.3	6.9
102	0.008	8.1	13.1	13.0	12.4
114	0.010	10.3	16.6	16.4	15.6
127	0.013	12.7	20.5	20.3	19.3
140	0.015	15.3	24.9	24.5	23.4
152	0.018	18.2	29.6	29.2	27.8
178	0.025	24.8	40.3	39.7	37.8
191	0.029	28.5	46.2	45.6	43.4
200	0.031	31.4	51.0	50.2	47.9
203	0.032	32.4	52.6	51.9	49.4
216	0.037	36.6	59.4	58.5	55.8
222	0.039	38.8	62.9	62.0	59.1
254	0.051	50.7	82.2	81.0	77.2
279	0.061	61.3	99.4	98.0	93.4
292	0.067	67.0	108.7	107.1	102.1
305	0.073	73.0	118.3	116.7	111.2
311	0.076	76.1	123.3	121.6	115.9
318	0.079	79.2	128.4	126.6	120.6
324	0.082	82.4	133.6	131.7	125.5
438	0.151	150.8	244.5	241.1	229.8
445	0.155	155.2	251.7	248.1	236.5
610	0.292	291.9	473.3	466.7	444.7
660	0.343	342.6	555.5	547.7	521.9
762	0.456	456.1	739.6	729.2	694.9
914	0.657	656.8	1065.0	1050.0	1000.7

Notes:

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

  Example:
  5-inch (127 mm) casing in an 8 3/4" (~222 mm) drilled hole, and using 1/4" pellets
  Volume needed = (volume drilled hole) - (volume casing O.D.)
  29.48 lb - 9.63 lb = 19.85 lb to fill 1 foot of annular space
  62.9 kg – 20.5 kg = 42.4 kg to fill 1 meter of annular space

Note:

- 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.

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 Distributor. To locate the Baroid IDP distributor nearest you contact the Customer Service Department in Houston or your area IDP Sales Representative.

Baroid Industrial Drilling Products
Product Service Line, Halliburton
3000 N. Sam Houston Pkwy. E.
Houston, TX 77032

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