BAROTHERM® GOLD

Two-Part Thermally Conductive Grout

Description

BAROTHERM® GOLD thermally conductive grout is a bentonite material designed for use in grouting boreholes containing ground source heat loops, and related applications. BAROTHERM GOLD thermally conductive grout when combined with silica sand at various concentrations yields a grout with thermal conductivity values ranging between 0.4 and 1.2 BTU/hr·ft·ºF (0.69 – 2.08 watts/m·°C).

Applications/Functions

The use of BAROTHERM GOLD thermally conductive grout assists and promotes the following:

- A thermally conductive grout medium with low permeability for sealing ground source heat loops

Advantages

- Promotes efficient heat transfer
- Creates a low permeability seal
- Develops a permanent, flexible seal to prevent commingling between aquifers
- No heat of hydration
- No Portland or aluminum cement added
- No gypsum added
- NSF/ANSI Standard 60 Certified

Typical Properties

Appearance	Beige to tan powder
Specific gravity	2.6
Thermal Conductivity (k) range	0.4 – 1.2 BTU/hr·ft·ºF 0.69 – 2.08 watts/m·°C
Yield Volume range	17.6– 41.8 gal/batch 66.7 – 158.2 liters/batch
Grout Weight range	10.1 – 15.0 lb/gal 1.21 – 1.80 SG
Permeability	< 1.0 x 10^{-7} cm/sec

Recommended Treatment

The recommended treatment is based on the desired thermal conductivity value or k. Please refer to the treatment tables below.

k Btu/hr·ft·°F	Silica Sand lb/50 lb	Water gal/50 lb	Slurry Volume Yield (gallons)	Density lb/gal	Total Solids
0.4	0	15.3	17.6	10.1	28.1%
0.69	100	15.3	22.2	12.5	54.0%
0.76	150	16.3	25.5	13.2	59.5%
0.88	200	17.3	28.8	13.7	63.4%
1	250	18.3	32.1	14.1	66.3%
1.1	350	20.0	38.5	14.7	70.6%
1.2	400	21.0	41.8	15.0	72.0%

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Recommended Treatment (continued)

k watts/m·°C	Silica Sand kg/22.7 kg	Water liters/22.7kg	Slurry Volume Yield (liters)	Density SG	Total Solids
0.69	0	57.9	66.7	1.21	28.1%
1.19	45.4	57.9	84.0	1.50	54.0%
1.32	68.0	61.7	96.5	1.58	59.5%
1.52	90.7	65.5	109.0	1.64	63.4%
1.73	113.4	69.3	121.5	1.69	66.3%
1.90	158.8	75.7	145.7	1.76	70.6%
2.08	181.4	79.5	158.2	1.80	72.0%

Recommended Mixing Procedure

- Using a mixing device, blend one sack of BAROTHERM® GOLD thermally conductive grout into water. Rate of addition should be about 20 to 30 seconds per 50-lb (22.7 kg) bag. Mix adequately, typically 30 to 90 seconds, depending on the mixer. Add sand at a rate of 20 to 30 seconds per sack and pump.
- Dry sand ranging between 50 and 70 mesh and containing greater than 99% silica is recommended.
- Blend, do not over mix and do not use a centrifugal pump. Place through a 1.25 inch (32 mm) minimum I.D. tremie into hole without delay.
- Bentonite grouts may not be appropriate for formation water chemistries where total hardness is greater than or equal to 500 parts per million and/or the chloride content is 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

BAROTHERM GOLD thermally conductive grout is packaged in 50-lb (22.7 kg) multiwall paper bags, containing 0.7 ft^3 (0.02 m^3). 3000-lb supersacks are available by special order.

Availability

BAROTHERM GOLD thermally conductive grout 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
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