



BAROID BORE-GROUT™

Horizontal Grout

Description BORE-GROUT™ horizontal heat loop grout is a bentonite material designed for use in grouting boreholes containing horizontally installed ground source heat loops. BORE-GROUT horizontal heat loop grout is also used where a grout is required to be placed around a horizontally installed product line. BORE-GROUT horizontal heat loop grout is designed to be mixed and pumped neat with standard horizontal directional drilling (HDD) rig equipment. Alternately, silica sand may be added to BORE-GROUT horizontal bentonite grout to increase the thermal conductivity, up to 1.2 BTU/hr-ft·°F (0.69 – 2.08 watts/m·°C). Sand-enhanced BORE-GROUT horizontal heat loop grout systems will require dedicated grouting equipment for mixing and placement. BORE-GROUT horizontal heat loop grout should only be used in the saturated zone.

Applications/ Functions

The use of BORE-GROUT horizontal heat loop grout promotes the following:

- A thermally conductive grout medium with low permeability for sealing ground source heat loops installed in horizontal bores
- A low permeability bentonite grout for sealing horizontal bores

Advantages

- Promotes efficient heat transfer
- Produces a uniform slurry for smooth pumping - No need to add extra water
- 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) | 0.4 BTU/hr-ft·° , neat
0.69 watts/m·°C , neat |
| • Yield Volume (before pumping) | 22.3 gal/batch
84.4 liters/batch |
| • Grout Weight (before pumping) | 9.7 lb/gal
1.17 SG |
| • Typical Permeability* | 3.0 x 10 ⁻⁸ cm/sec |
- *Test data can be provided upon request.

Recommended Treatment

- The recommended treatment is to mix one 50-lb (23 kg) bag of BORE-GROUT™ horizontal heat loop grout in 20 gallons (75.7 liters) of water.
- Please refer to the treatment tables below for slurry properties.

Recommended Treatment Tables

k Btu/hr-ft.°F	Silica Sand (lb/50 lb bag)	Water (gal/50 lb bag)	Slurry Volume Yield (gallons)	Density (lb/gal)	Total Solids
0.4	0	20.0	22.3	9.7	23.0%

k watts/m.°C	Silica Sand (kg/23 kg bag)	Water (liters/23 kg bag)	Slurry Volume Yield (liters)	Specific Gravity	Total Solids
0.69	0	75.7	84.4	1.17	23.0%

Recommended Mixing Procedure

- Pre-treat mixing water with Soda Ash (sodium carbonate) to reduce total hardness to less than 100 mg/l and raise pH to 8.5-9.5.
- Using the HDD rig equipment, blend one 50-lb bag of BORE-GROUT horizontal heat loop grout into 20 gallons (75.5 liters) of fresh water. Rate of addition should be about 20 seconds per 50-lb (23 kg) bag. Mix adequately, typically 30 seconds, depending on the mixer.
- Blend, do not over mix. Pump without delay through drill rods while pulling product line

NOTE: Bentonite grouts may not be appropriate for formation water chemistries where total hardness is 500 parts per million or greater and/or the chloride content is 1500 parts per million or greater. If 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.

Alternate Treatment

- Do not use a centrifugal pump
- Using a standard grouter or other mixing device, , blend one 50-lb (23 kg) bag of BORE-GROUT horizontal heat loop grout into water. Rate of addition should be about 10 to 20 seconds per 50-lb bag.
- Immediately add sand at a rate of 5 to 10 seconds per 50 pounds (23 kg) and pump. Additional mixing time after the addition of sand is not required and is not recommended.
- Dry sand ranging between 50 and 70 mesh and containing greater than 99% silica is recommended.
- Blend, do not over mix. Place through a 1.25 inch (32 mm) minimum I.D. tremie into

Packaging

BORE-GROUT horizontal bentonite grout is packaged in 50-lb (23 kg) multiwall paper bags, containing 0.7 ft³ (0.02 m³). 3000-lb supersacks are available by special order.