BAROTHERM®

Two-Part Thermally Conductive Grout

Description
BAROTHERM® grout is a bentonite material designed for use in grouting boreholes containing ground source heat loops. BAROTHERM grout, when combined with sand at various concentrations, yields a grout with thermal conductivity values ranging between 0.4 and 1.0 BTU/hr·ft·ºF. BAROTHERM grout does not contain any polymers.

Applications/Functions
- Can seal or grout plastic ground source heat loops
- Can seal or grout water well annular spaces

Advantages
- Helps provide efficient heat transfer
- Helps create a low permeability seal
- Helps develop a permanent, flexible seal to prevent commingling between aquifers
- NSF/ANSI Standard 60 certified
- No heat of hydration

Typical Properties
- Appearance: Beige to tan powder
- Specific gravity: 2.6
- Thermal Conductivity (k) range: 0.4 – 1.0 BTU/hr·ft·ºF
- Yield Volume range: 16.4 – 33.7 gal/unit
- Grout Weight range: 10.2 – 13.7 lb/gal
- Permeability: < 7.0 x 10⁻⁸ cm/sec

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

<table>
<thead>
<tr>
<th>k</th>
<th>Silica</th>
<th>Water</th>
<th>Yield</th>
<th>Weight</th>
<th>Total Solids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Btu/hr·ft·ºF</td>
<td>lb/50 lb</td>
<td>gal/50 lb</td>
<td>gal/50 lb</td>
<td>lb/gal</td>
<td>%</td>
</tr>
<tr>
<td>0.4</td>
<td>0</td>
<td>14</td>
<td>16.4</td>
<td>10.2</td>
<td>30.0%</td>
</tr>
<tr>
<td>0.52</td>
<td>50</td>
<td>14.6</td>
<td>19.4</td>
<td>11.4</td>
<td>45.1%</td>
</tr>
<tr>
<td>0.64</td>
<td>100</td>
<td>15.5</td>
<td>22.7</td>
<td>12.3</td>
<td>53.7%</td>
</tr>
<tr>
<td>0.76</td>
<td>150</td>
<td>16.5</td>
<td>26.1</td>
<td>13.0</td>
<td>59.2%</td>
</tr>
<tr>
<td>0.88</td>
<td>200</td>
<td>17.6</td>
<td>29.6</td>
<td>13.4</td>
<td>63.0%</td>
</tr>
<tr>
<td>1</td>
<td>250</td>
<td>19.3</td>
<td>33.7</td>
<td>13.7</td>
<td>65.1%</td>
</tr>
</tbody>
</table>

Because the conditions of use of this product are beyond the seller’s control, the product is sold without warranty either express or implied and upon condition that purchaser make its own test to determine the suitability for purchaser’s application. Purchaser assumes all risk of use and handling of this product. This product will be replaced if defective in manufacture or packaging or if damaged. Except for such replacement, seller is not liable for any damages caused by this product or its use. The statements and recommendations made herein are believed to be accurate. No guarantee of their accuracy is made, however.
Recommended Mixing Procedure

- Using a mixing device, blend one sack of BAROTHERM grout into water. Rate of addition should be about 20 to 30 seconds per 50-lb (22.7 kg) bag. Mix for approximately 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 is recommended.
- Blend, do not over mix and do not use a centrifugal pump. Pump through tremie into hole without delay.
- 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
BAROTHERM grout is packaged in 50-lb (22.7 kg) multiwall paper bags, containing 0.7 ft³ (0.02 m³).

Availability
BAROTHERM 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