



# BadgerFrac®

*Superior by Nature, Quality by Badger®*

Mesh Size	T1220F	T1630F	T2040F	T3050F	T4070F	FW4070F	T50140F	FW50140F
8	0.0	-	-	-	-	-	-	-
12	0.4	0.0	-	-	-	-	-	-
14	8.9	-	-	-	-	-	-	-
16	29.7	1.6	0.0	-	-	-	-	-
18	41.5	9.8	-	-	-	-	-	-
20	17.6	36.5	0.4	0.0	-	-	-	-
25	-	44.7	10.3	-	-	-	-	-
30	1.8	6.6	26.8	0.7	-	-	-	-
35	-	-	35.8	7.2	-	-	-	-
40	-	0.8	21.5	40.4	1.8	0.9	-	-
45	-	-	-	36.5	16.5	19.6	-	-
50	-	-	5.1	11.1	28.2	32.7	2.3	3.4
60	-	-	-	-	36.7	30.9	-	-
70	-	-	-	4.0	14.6	13.0	23.8	27.0
80	-	-	-	-	1.9	2.4	27.5	28.9
100	-	-	-	-	0.1	0.3	26.7	22.0
120	-	-	-	-	0.1	0.1	13.6	11.2
140	-	-	-	-	-	-	4.6	5.0
170	-	-	-	-	-	-	-	-
200	-	-	-	-	-	-	1.2	2.2
Pan	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.3
Percent Retained	97.7	97.6	94.4	95.2	96.0	96.2	96.2	93.9
NTU	47	52	45	43	43	34	51	40
Acid Solubility	0.44	0.34	0.35	0.56	0.56	0.51	1.12	1.13
Crush K Value	4,000	6,000	6,000	8,000	9,000	9,000	10,000	11,000

## Hydraulic Fracturing Sands

BadgerFrac® set the standard for quality, consistency and conductivity for natural proppants. Processed from our two production facilities in Wisconsin, our products are renowned for their exceptional strength and particle segregation. Material is available for delivery by rail direct from the mine site or through our extensive North American distribution network.

### Conductivity (md-ft @ 150°F)

Closure Stress	T1220F	T1630F	T2040F	T3050F	T4070F	FW4070F	FW50140F	T50140F
2,000	13,280	8,349	2,764	1,512	949	1077	362	340
4,000	5,754	5,228	2,080	1,046	775	891	289	292
6,000	2,565	2,255	1,277	688	536	633	219	231
8,000	1,223	1,091	674	438	278	340	148	155
10,000	575	591	356	249	139	165	90	90

### Permeability (Darcy)

2,000	712	449	152	84	51	57	20	18
4,000	320	292	117	59	42	48	16	16
6,000	149	130	74	40	30	35	12	13
8,000	74	66	40	26	16	20	8	9
10,000	36	37	22	15	8	9.5	5	5

	T-Grade	FW-Grade
Silicon Dioxide (SiO <sub>2</sub> )	99.20%	99.70%
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> )	0.10%	0.19%
Calcium Oxide (CaO)	0.08%	0.21%
Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> )	0.06%	0.03%
Potassium Oxide (K <sub>2</sub> O)	0.05%	0.14%
Magnesium Oxide (MgO)	0.01%	0.02%
Sodium Oxide (Na <sub>2</sub> O)	0.003%	0.002%
Titanium Dioxide (TiO <sub>2</sub> )	<0.01%	<0.01%

### Chemical Properties

### Physical Properties

Specific Gravity	2.65
Particle Density (lb./gal.)	22.11
Absolute Volume (cm <sup>3</sup> /g)	0.38
Absolute Volume (gal./lb.)	0.0453

\* Document updated October 21, 2016

All chemical and physical properties are typical and tested in accordance with ISO 13503-2/API 19C in BMC's laboratories. We give no warranty for our products, either expressed or implied. We recommend that you confirm all properties in the laboratory of your choice.

#### Silica Sand and Resin-Coated Silica Sand Products DANGER



These products have been classified, following the Globally Harmonized System (GHS) of Classifying and Labeling Chemicals criteria, as a Category 1A Carcinogen, a Category 1 Specific Target Organ Toxicity (following repeated exposures), and a Category 2B Eye Irritant. For Industrial Use Only. DO NOT USE THIS PRODUCT FOR BLASTING OR AS AN ABRASIVE. DO NOT PNEUMATICALLY UNLOAD THE RESIN-COATED SILICA SAND PRODUCTS AT A PRESSURE EXCEEDING 5 PSI SO AS TO AVOID ABRADING THE PRODUCT. DO NOT BREATHE DUST. Read the specific Safety Data Sheet (SDS) before using and follow applicable local, state and federal health and safety standards. The SDSs for the products are available online at [www.badgerminingcorp.com](http://www.badgerminingcorp.com) or by calling 715-662-2400. October 22, 2016 Revision E