



BNZ Materials, Inc.

Refractory Bonding Mortars

Refractory Products



Refractory Bonding Mortars are finely ground refractory materials which are plastic, or become plastic and trowelable when mixed with water. Our mortars are suitable for laying and bonding insulating fire brick and most clay-based dense fire brick.

The compositions and methods of preparation of all mortars have been developed through extensive laboratory investigations to develop the particular combination of properties each bonding mortar should possess. Among the factors included are workability, plasticity, water retention, drying and firing shrinkages, chemical composition, refractoriness, bonding strength, vitrification and resistance to chemical attack.

Refractory Bonding Mortars

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Typical Applications

Mortars serve the following purposes:

1. They bond the brickwork into a solid unit with greater resistance to mechanical and thermal shocks and stresses.
2. They provide a cushion between the slightly irregular surfaces of the brick to provide a firm bearing for each course.
3. They provide resistance to infiltration of air or hot gases.
4. They retard penetration of slag and molten metal into the joints.

Available Types

The two general classes of refractory mortars are air-setting and heat-setting. Air-setting mortars take a rigid set upon air drying, while heat-setting mortars set at high temperatures by sintering, or developing a ceramic bond. To fulfill the many different service requirements, we provide several types of air-setting mortars, which we believe are preferred versus heat-setting mortars for insulating fire brick.

Air-Setting Mortars

Air-setting mortars are mixtures of finely ground aggregates plus binders, supplied in either a wet or a dry condition. The dry air-setting mortars require tempering with water to attain the desired consistency. Upon air drying, they set to a good strength and form a very strong joint and an almost monolithic structure with the brickwork.

Wet Air-Setting Mortars

Blakbond® A highly refractory mortar which possesses high water retention properties. It is especially designed for laying insulating fire brick and is also used for super duty and high alumina dense refractory brick. It is dark gray in color. Temperature to 3000°F. It is furnished in a consistency suitable for shallow patching or trowelling. For a dipping consistency, add approximately 5 qts. of water to 100 lbs. of the as-received Blakbond. Blakbond is a good choice for a single mortar on jobs involving a majority of insulating fire brick and a few dense fire brick.

No. 2986. A highly refractory mortar very similar to Blakbond, but gray to tan in color. Temperature to 3000°F.

Super Blakbond® An air-setting mortar for general purpose plant use. It has greater air-setting strength than Blakbond or No. 2986. It is good for insulating fire brick where greater bond strength is desired, and can also be used for dense fire brick. Super Blakbond is particularly good for deep patching. It is also used for coating over industrial boiler tubes to level the surface and for shallow patching. The overall excellent properties of Super Blakbond make it ideal for the one mortar to carry in plant inventory. Temperature to 3000°F. An excellent choice for the one mortar on a job involving dense fire brick and insulating fire brick.

No. 20. An air-setting mortar, gray in color, for use where extra hard air-set strength is desired. It is not recommended for laying insulating fire brick. Used up to 2700°F for setting hard brick with a rubbed joint and for wash-coating hard brick. When desired to use old fire brick as a patching material or monolithic fill, No. 20 is thinned with water and the crushed brick added.

Note: Coating IFB is rarely advisable. Please discuss with a BNZ Representative if this is being considered.

Standard Sizes

Wet Mortars

All wet mortars are available in 50# pails and 100# and 200# drums. Additionally, Blakbond and No. 20 mortars are available in 15# cans.

Storage and Use

Wet mortars should generally be used within one year of receipt. If a wet mortar becomes frozen, it can normally be remixed and used, after being slowly returned to approximately 70°F by placement in a warm storage area. Storage of wet mortars should be in a cool area to minimize the potential of premature hardening.

Bags of dry mortar should be kept in protected, low humidity storage areas to assure retention of product qualities.

Typical Data

Properties	Air-Setting			
	Wet, Ready-Mixed			
	Super Blakbond	No. 2986	Blakbond	Zelie No. 20
Temp. Limit, °F	3000	3000	3000	2700
Estimated lbs. to set 1000 9" x 4 1/2" x 2 1/2" brick*	200 - 400	200 - 400	200 - 400	200 - 400
Modulus of Rupture, psi Mortar	4200	4000	6100	4700
Modulus of Rupture, psi Dipped Joint, ASTM C 198	375	525	575	—
Linear Shrinkage, %, @ 212°F	4.3	5.0	4.1	5.1
Refractoriness, ASTM C 199	No flow @ 3000°F	—	No flow @ 3000°F	—
Chemical Analysis, %				
SiO ₂	48.8	46.8	48.1	90.8
Al ₂ O ₃	43.2	46.3	43.1	5.1
Fe ₂ O ₃	1.2	1.5	1.6	—
TiO ₂	1.5	1.1	1.4	—
CaO	0.3	0.2	0.3	—
MgO	—	—	—	—
K ₂ O	0.8	0.9	0.9	—
Na ₂ O	2.4	2.4	2.7	3.3
Misc.	—	0.1	—	0.8
Ig. Loss	1.8	1.2	1.7	—
Bulk Density of Refractory Mortars				
As received, pcf	126	129	131	121
Troweling, pcf	—	—	—	—
Percent H ₂ O	—	—	—	—
Dipping, pcf	124	126	123	116
Percent H ₂ O	4	4	7	10

* Amount depends upon thickness of joint and porosity of the brick.

The physical and chemical properties of BNZ's Refractory Bonding Mortars represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice.



BNZ Materials, Inc.

BNZ Materials manufactures, and is a worldwide supplier of a range of specialty industrial insulations. BNZ Insulating Fire Brick has been manufactured continuously at Zelienople, Pennsylvania for more than 50 years.

In addition to the Insulating Fire Brick product line, BNZ also manufactures many grades of Structural Insulations under the tradenames Marinite, Transite and CS85. These products are designed for use from ambient temperatures to 1800°F, in densities from 36 to 100 pcf, and will meet the demanding requirements of a variety of industries and their specific needs.

Contact BNZ for more information on these products and their applications.

Bonding Mortars Plant Location

Zelienople

191 Front Street
Zelienople, PA 16063
Phone: **724-452-8650**
800-955-8650
FAX: 724-452-1346

CS85,[™] Marinite[®] & Transite[®] Plant Location

Billerica

400 Iron Horse Park
North Billerica, MA 01862
Phone: 978-663-3401
800-888-0061
FAX: 978-663-2735

Corporate Headquarters

Denver

6901 South Pierce Street
Suite 260
Littleton, CO 80128
Phone: 303-978-1199
800-999-0890
FAX: 303-978-0308
www.bnzmaterials.com

Warranty

BNZ Materials warrants that its products are manufactured in accordance with its applicable material specifications and are free from defects in workmanship and materials using BNZ's specifications as a standard. Every claim under this warranty shall be deemed waived unless in writing and received by BNZ within thirty (30) days of the date the defect was discovered and within one (1) year of the date of the shipment of the product.

BNZ MAKES NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, IN FACT OR IN LAW, INCLUDING WITHOUT LIMITATION, THE WARRANTY OF MERCHANTABILITY OR THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, OTHER THAN THE LIMITED WARRANTY SET FORTH ABOVE.

Limitation of Liability

It is expressly understood and agreed that the limit of BNZ's liability shall be the resupply of a like quantity of non-defective product and that BNZ shall have no such liability except where the damage or claim results solely from breach of BNZ's warranty.

IT IS ALSO AGREED THAT BNZ SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, OR OTHER DAMAGES FOR ANY ALLEGED NEGLIGENCE, BREACH OF WARRANTY, STRICT LIABILITY, OR ANY OTHER THEORY, OTHER THAN THE LIMITED LIABILITY SET FORTH ABOVE.