

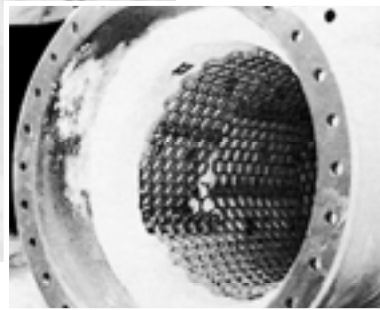
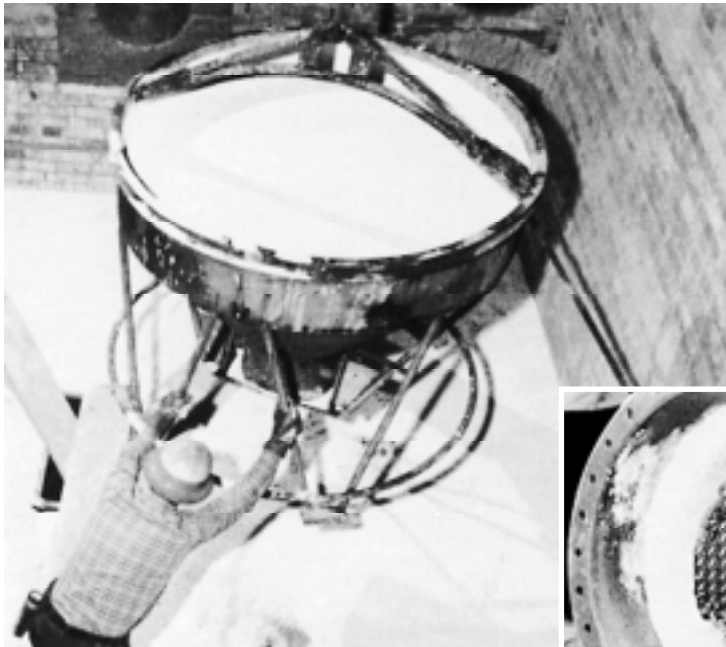


BNZ Materials, Inc.

Insulating and Dense Castables and Gunning Mixes

Refractory products

**Hydraulic-Setting
Monolithic Refractories**



BNZ manufactures a variety of insulating and dense castable refractories to meet the exacting needs of the high temperature processing industries. These hydraulic setting products are suitable for installation by various methods including gunning, casting or slap-troweling. Each product is specifically formulated to economically obtain the desired properties for the application and service temperature for which it is intended.



Insulating Castables and Gunning Mixes

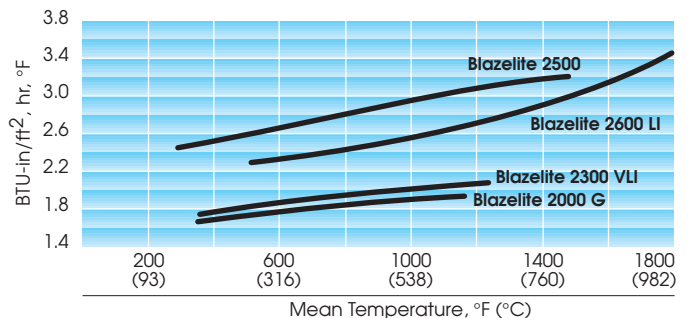
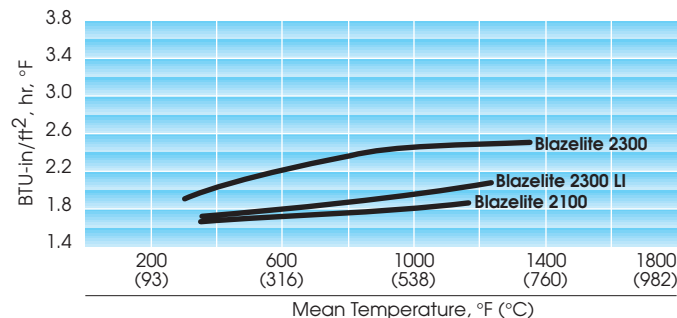
Refractory products

Hydraulic-Setting Monolithic Refractories

Physical Properties

	Blazelite 2000 G	Blazelite 2100	Blazelite 2300	Blazelite 2300 LI	Blazelite 2300 VLI	Blazelite 2500	Blazelite 2600 LI
Maximum Service Temperature, °F (°C)	2100 (1149)	2100 (1149)	2300 (1260)	2300 (1260)	2300 (1260)	2500 (1371)	2600 (1427)
Yield, lbs dry mix required per cu. ft. of construction without rebound (kg/m³)	62 (993)	60 (961)	64 (1025)	54 (865)	59 (945)	79 (1265)	74 (1185)
Density, lb/ft³ (kg/m³) Fired 5 hrs. at 1500°F (816°C)	64 (1025)	65 (1041)	70 (1121)	61 (977)	66 (1057)	78 (1249)	72 (1150)
Mixing Water Required, (Approx) U.S. qt/100 lb dry material (Liter/100 kg dry material)	26 54	25 52	30 63	32 67	31 65	20 41	24 49
Modulus of Rupture, psi (kg/cm²) (MPa) ASTM C 258 Dried at 220°F (104°C) Fired at 1000°F (540°C) 1500°F (815°C) 2000°F (1095°C) 2300°F (1260°C) 2500°F (1371°C)	150 (1.03) 70 (0.46) 90 (0.62) 90 (0.62) 90 (0.62)	160 (1.10) 120 (0.83) 150 (1.03) 130 (0.90)	130 (0.90) 70 (0.48) 80 (0.55) 90 (0.62) 200 (1.38)	130 (0.90) 150 (1.03) 60 (0.40) 50 (0.34) 90 (0.62)	140 (0.97) 80 (0.55) 90 (0.62) 90 (0.62) 140 (0.97)	330 (2.78) 160 (1.10) 140 (0.93) 120 (0.83) 200 (1.38) 290 (2.00)	240 (1.65) 160 (1.10) 110 (0.76) 120 (0.83) 100 (0.69) 300 (2.07)
Cold Crushing Strength, psi (kg/cm²) Dried at 220°F (104°C) Fired at 1000°F (540°C) 1500°F (815°C) 2000°F (1095°C) 2300°F (1260°C) 2500°F (1371°C)	600 (4.13) 430 (2.96) 420 (2.90) 340 (2.34)	400 (2.75) 390 (2.69) 570 (3.93) 420 (2.84)	400 (2.75) 320 (2.21) 500 (3.45) 270 (1.86) 550 (3.79)	700 (4.82) 410 (2.82) 410 (2.82) 320 (2.20) 430 (2.96)	600 (4.13) 310 (2.14) 370 (2.55) 310 (2.19) 550 (3.86)	1500 (10.33) 1200 (8.27) 1200 (8.27) 800 (5.51) 1100 (7.58) 1400 (9.65)	700 (4.82) 1000 (6.89) 700 (4.82) 700 (4.82) 700 (4.82) 700 (4.82)
Permanent Linear Change, % ASTM C 269 Fired at 1000°F (540°C) 1500°F (815°C) 2000°F (1095°C) 2300°F (1260°C) 2500°F (1371°C)	-0.1 -0.2 -0.3	-0.2 -0.2 -0.2	-0.2 -0.1 -0.2 -0.9	-0.1 -0.2 -0.4 -1.0	-0.1 -0.2 -0.2 -0.7	-0.2 -0.2 -0.2 -0.5 -0.7	-0.2 -0.2 -0.2 -0.5 -2.1
Chemical Analysis, % fired basis per ASTM C 573 Alumina – Al ₂ O ₃ Silica – SiO ₂ Ferric Oxide – Fe ₂ O ₃ Titania – TiO ₂ Calcium Oxide – CaO Magnesia – MgO Alkalies – as Na ₂ O + K ₂ O Others	34.0 40.1 6.5 1.9 15.8 0.3 0.8	35.3 40.5 4.0 1.7 16.9 0.5 1.1	43.9 43.8 3.2 1.8 6.7 0.2 0.9	41.3 41.0 0.9 1.6 14.1 0.2 1.2	47.8 35.0 0.5 1.0 15.1 — 0.9	43.6 38.2 2.7 1.0 13.6 0.4 0.5	51.0 40.1 0.8 1.2 4.7 0.1 0.1 2.0
ASTM Class C 64 & C 401	P	P	P & Q	O, P & Q	P & Q	Q	Q

Thermal Conductivity



Dense Castables and Gunning Mixes

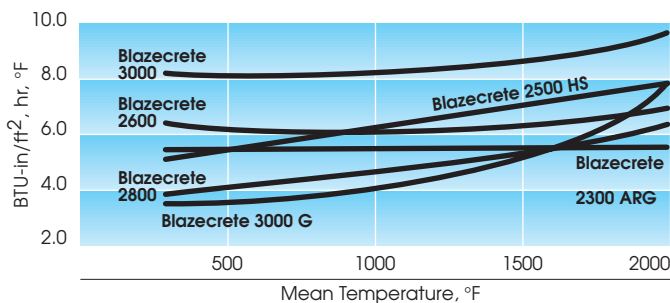
Refractory products

Hydraulic-Setting Monolithic Refractories

Physical Properties

	Blazecrete 2300 ARG	Blazecrete 3000 G	Blazecrete 2500 HS	Blazecrete 2600	Blazecrete 2800	Blazecrete 3000	Blazecrete 3200
Maximum Service Temperature, °F (°C)	2300 (1260)	3000 (1649)	2500 (1371)	2600 (1427)	2800 (1537)	3000 (1649)	3200 (1760)
Density, lb/ft³ (kg/m³)							
Fired 5 hrs. at 1750°F (955°C)*	120 (1922)	130 (2082)	124 (1986)	130 (2082)	128 (2050)	135 (2162)	149 (2387)
Mixing Water Required, (Approx)							
U.S. qt/100 lb dry material	7	7	6	7	6	5	4
(Liter/100 kg dry material)	(15)	(15)	(12)	(15)	(12)	(10)	(8)
Modulus of Rupture, psi (MPa)							
ASTM C 268							
Dried at 220°F (104°C)	1100 (7.6)	200 (1.4)	1100 (7.6)	400 (2.8)	500 (3.4)	700 (4.8)	1000 (6.9)
Fired at 1000°F (540°C)	300 (2.1)	100 (0.7)	300 (2.1)	130 (0.9)	200 (1.4)	400 (2.8)	700 (4.8)
1500°F (815°C)	300 (2.1)	100 (0.7)	300 (2.1)	100 (0.7)	150 (1.0)	300 (2.1)	700 (4.8)
2000°F (1095°C)	200 (1.4)	130 (0.9)	200 (1.4)	100 (0.7)	200 (1.4)	300 (2.1)	700 (4.8)
2300°F (1260°C)	300 (2.1)	200 (1.4)	300 (2.1)	200 (1.4)	300 (2.1)	500 (3.4)	1200 (8.3)
2500°F (1371°C)		250 (1.7)	700 (4.8)	600 (4.1)	500 (3.4)	800 (5.5)	1400 (9.6)
At use limit		1000 (6.9)		700 (4.8)	900 (6.2)	1000 (6.9)	1200 (8.3)
Cold Crushing Strength, psi (MPa)							
Dried at 220°F (104°C)	7100 (48.9)	1200 (8.3)	8000 (55.2)	2600 (17.9)	3000 (20.7)	4200 (28.9)	8400 (57.9)
Fired at 1000°F (540°C)	3200 (22.4)	1100 (7.6)	6400 (44.1)	2100 (14.5)	2200 (15.2)	4300 (29.6)	5300 (36.5)
1500°F (815°C)	3500 (24.1)	900 (6.2)	5600 (38.6)	1800 (12.4)	2500 (17.2)	3700 (25.5)	6100 (42.0)
2000°F (1095°C)	2400 (16.5)	900 (6.2)	2700 (18.6)	1000 (6.9)	1300 (9.0)	2700 (18.6)	4300 (29.6)
2300°F (1260°C)	2600 (17.9)	1200 (8.3)	3400 (23.4)	2100 (14.5)	2200 (15.2)	3100 (21.4)	3900 (26.9)
2500°F (1371°C)		1500 (10.3)	5200 (35.8)	4000 (27.6)	5100 (35.1)	7100 (49.0)	5500 (37.9)
At use limit		5000 (34.5)			7000 (48.8)	9200 (63.4)	7800 (53.8)
Permanent Linear Change, %							
ASTM C 269							
Dried at 200°F (104°C)	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
Fired at 1000°F (540°C)	-0.2	-0.1	-0.1	0.0	-0.1	-0.1	-0.1
1500°F (815°C)	-0.3	-0.1	-0.1	0.0	-0.1	-0.1	-0.1
2000°F (1095°C)	-0.3	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1
2300°F (1260°C)	-1.1	-0.5	-0.8	-0.2	0.0	-0.4	-0.4
2500°F (1371°C)		-0.9	+0.2	+1.8	+1.0	-0.7	-0.4
At use limit		+1.0			+2.9	+0.1	+0.9
Chemical Analysis, %							
fired basis per ASTM C 573							
Alumina – Al ₂ O ₃	33.4	53.9	42.9	45.5	47.6	53.0	65.3
Silica – SiO ₂	40.2	38.0	41.0	43.1	44.0	39.9	27.4
Ferric Oxide – Fe ₂ O ₃	7.9	1.7	5.5	3.4	1.8	0.6	1.1
Calcium Oxide – CaO	13.6	2.0	8.4	5.6	4.8	2.7	3.4
Magnesia – MgO			0.2	0.1	0.2	0.1	0.1
Alkalies – as Na ₂ O + K ₂ O	0.2		0.3	0.3	0.4		0.1
Others, TiO ₂ , etc.	1.0	2.6	1.7	1.9	1.3	1.5	2.3

Thermal Conductivity



* Use this density for yield; approximate lbs/cu ft of dry material required for construction.

The physical and chemical properties of BNZ's Insulating and Dense Castables and Gunning Mixes represent 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. Results should not be used for specification purposes.

Insulating and Dense Castables and Gunning Mixes

Refractory products

Hydraulic-Setting Monolithic Refractories

Blazelite® Insulating Castables

The unique aggregate used in BNZ Insulating Castables allows for the formulation of especially low density, thermally efficient products unsurpassed by other products.

Blazelite 2100

A general purpose lightweight castable for use as an exposed hot face refractory or as a very thermally efficient back-up to a dense refractory lining. Can be installed by casting, gunning or slap-troweling.

Blazelite 2300

A lightweight, general purpose insulating castable. Can be used for back-up or exposed to furnace conditions. Used for one-shot linings, petrochemical heaters, combustion chambers and furnace doors and covers. Frequently used in those areas that would require a 2300°F (1260°C) Insulating Fire Brick.

Blazelite 2300 LI and Blazelite 2300 VLI

Similar to Blazelite 2300 but suitable for those applications where reducing conditions might be encountered. These high purity, low iron products are specifically designed for both back-up and exposed to furnace combustion conditions.

Blazelite 2500

An extremely strong insulating castable designed for general purpose use in those areas that require this combination of light weight and high strength, such as forge furnace doors and roofs, reheat furnace sub-hearths, petrochemical stills and heater linings, metal heating furnace hearths, cat-cracking units, reactor vessels, flue and duct linings and kiln car tops.

Blazelite 2600 LI

A low iron, high purity castable for service to 2600°F (1427°C) in controlled atmosphere applications. Recommended for casting monolithic shapes and furnace linings.

Blazelite 2000 G

Widely used for stack linings, heaters and vessels where a gunning mix with low rebound loss is required.

Blazecrete® Gunning Mixes

Blazecrete 3000 G

High alumina castable for service to 3000°F (1667°C). Used in building new and repairing old refractory linings, for gunning applications and heavy patching by slap-troweling.

Blazecrete 2300 ARG

An alumina-silica castable with high strength and abrasion resistance. For service to 2300°F (1260°C). May be gunned or slap-troweled over Blazelite 2000G to obtain a high strength hot face with a good insulating back-up. Suitable for ash pits, dust collector flues and other areas where abrasive or erosive conditions exist.

Blazecrete® Castables

Blazecrete 3200

A high alumina castable for service to 3200°F (1778°C). It has good volume stability, extremely high modulus of rupture and crushing strength, and is of high purity for special furnace atmospheres. Designed for use in casting burner blocks, roof centers in electric arc furnaces, continuous casting tundish covers, incinerators, and other areas where these extremely high temperatures are encountered.

Blazecrete 3000

A high alumina, high strength, general purpose castable for service to 3000°F (1667°C). Used for casting burner blocks, door linings, car tops, crucible furnace linings and special shapes. High purity for special furnace atmospheres.

Blazecrete 2800

An economical, high alumina refractory for service to 2800°F (1556°C). Suitable for door linings, curbs and covers, pre-cast shapes, grey iron ladles, aluminum reverberatory furnace upper side walls and roofs.

Blazecrete 2600

A general purpose castable for service to 2600°F (1427°C). It is especially effective in casting door linings, boiler walls, monolithic car tops, hearths, fire boxes, as well as safety linings in continuous casting tundishes.

Blazecrete 2500 HS

A high-duty castable designed to withstand loads and resist normal abrasion and erosion at moderate temperatures to 2500°F (1371°C). Use with Blazelite 2100 for a dual component lining for combined high strength and insulation. Used for ash hoppers, incinerator floors, dust collector linings, cupola charging zones and fireplace sidewalls and hearths.



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Castables & Gunning Mixes Plant Location

Zelienople

191 Front Street
Zelienople, PA 16063
Phone: (412) 452-8650
(800) 955-8650
FAX: (412) 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

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 over 50 years. Prior product identification was under the Johns-Manville JM trademark.

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.



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.