



**Typical Data**

Properties		PA-20	PA-23	PA-26
<b>ASTM Classification</b>		20	23	26
<b>Temperature Use Limit</b> (Normal oxidizing atmosphere)	°F (°C)	2000 (1093)	2300 (1260)	2600 (1427)
<b>Density, Avg.</b> ASTM C 134	lb/ft <sup>3</sup> (kg/m <sup>3</sup> ) lb/str.	39 (625) 2.3	44 (705) 2.6	49 (785) 2.9
<b>Modulus of Rupture</b> ASTM C 133	psi (kg/cm <sup>2</sup> )	85 (6.0)	115 (8.0)	180 (12.0)
<b>Cold Crushing Strength</b> ASTM C 133	psi (kg/cm <sup>2</sup> )	95 (7.0)	140 (10.0)	240 (17.0)
<b>Permanent Linear Change, %</b> ASTM C 210 24 hrs at soaking temp: °F (°C)				
2250 (1232)		-0.0	-0.0	—
2550 (1399)		—	—	-0.1
<b>Reversible Linear Thermal Expansion, %</b> at 2000°F (1093°C)		.06	.06	0.6
<b>Hot Load Strength, % deformation</b> ASTM C 16 10 psi load for 1½ hours: °F (°C)				
2000 (1093)		-0.5	-0.5	—
2200 (1204)		—	—	-0.2
<b>Maximum Mean Temperature, °F</b>		1800	2100	2200
<b>Thermal Conductivity, Btu-in/ft<sup>2</sup>, hr, °F; (W/mk)</b> ASTM C 182 Mean temperature, °F (°C)				
500 (260)		1.4 (0.20)	1.6 (0.23)	2.1 (0.30)
1000 (538)		1.8 (0.26)	2.0 (0.29)	2.4 (0.35)
1500 (816)		2.2 (0.32)	2.4 (0.35)	2.7 (0.39)
2000 (1093)		2.4 (0.35)	2.6 (0.37)	2.9 (0.42)

To convert Btu-in/ft<sup>2</sup>, hr, °F to Kcal-m<sup>2</sup>, hr, °C, multiply by 0.124.

Chemical Analysis	%			
Alumina – Al <sub>2</sub> O <sub>3</sub>		42.5	42.5	40.1
Silica – SiO <sub>2</sub>		51.5	51.5	57.0
Ferric Oxide – Fe <sub>2</sub> O <sub>3</sub>		0.7	0.7	0.7
Titanium Oxide – TiO <sub>2</sub>		1.5	1.5	1.5
Calcium Oxide – CaO		2.5	2.5	0.3
Magnesium Oxide – MgO		0.1	0.1	0.1
Alkalies, as Na <sub>2</sub> O & K <sub>2</sub> O		1.0	1.0	0.4

**The PA Series** of insulating fire brick (IFB) adds a lower cost alternative to BNZ's traditional line of IFB. The PA series is designed for applications where the lower density and finer texture of the standard BNZ grades is not required. They meet or exceed the specifications of ASTM C 155 for each listed grade, and are produced under BNZ's certified ISO 9002 Quality System.

**PA-20** is a low density brick suitable for applications where low conductivity and low thermal mass are required. Typical applications are batch furnaces and low temperature shuttle kilns where minimum heat storage is important.

**PA-23** features higher cold crushing strength than the PA-20. With its low reheat shrinkage, it is especially well suited for applications such as annealing and reheating furnaces.

**PA-26** blends excellent density, strength and temperature stability with low conductivity, making it ideal as backup insulation in reheat and forge furnaces.





## **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 over 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.

### **Insulating Fire Brick Plant Location**

#### **Zelienople**

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

### **CS85,<sup>™</sup> Marinite<sup>®</sup> & Transite<sup>®</sup> 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](http://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.