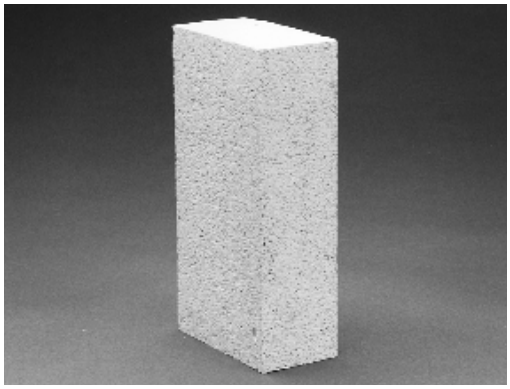
Low Temperature Insulating Firebrick

Product Information



Thermal Ceramics was first to introduce insulating firebrick (IFB) to the industry in the 1930's. The IFB are manufactured with a unique slurry casting process which creates a network of microporosity which produces low thermal conductivity and good thermal shock characteristics. This process produces brick that are some of the most efficient insulators available in the market. The anorthite mineralogy ($CaO \cdot Al_2O_3 \cdot 2\ SiO_2$) of these low temperature IFB gives them excellent strength at operating temperatures and resistance to corrosive alkali environments.

Features

- Extremely low "K" factors
- Low densities
- Low heat storage
- Excellent strength at room and high temperatures
- Excellent resistance to alkali attack
- Excellent service in applications involving special atmospheres

Applications

- Backup insulation for carbon baking furnaces
- Backup insulation in aluminum electrolytic cells
- Electrical kilns for industrial and hobby use
- Backup insulation for blast furnace stove linings
- Linings for carbonizing furnaces
- Forge furnace linings
- Heat transfer linings

Physical Characteristics

Standard sizes*	9" x 4½" x 2½" and 9" x 4½" x 3" (22.5 cm x 11.25 cm x 6.25 cm and 22.5 cm x 11.25 cm x 7.5 cm)
IFB 23 Tile	9" x 9" x 3" to 24½" x 9" X 3" (22.5 cm x 22.5 cm x 7.5 cm to 61.25 cm x 22.5 cm x 7.5 cm)

* Special sizes available upon request.

Manufacturing Process

TC-23, TC-23 HS, K®-23, K-25 IFB	casting
IFB 23 Tile	slinger

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Physical Properties	**TC-23**	**TC-23 HS**	**K-23**	**IFB 23 Tile**	**K-25**
Recommended Hot Face use limit,°F *(°C)*	2300 *(1260)*	2300 (1260)	2300 *(1260)*	2300 *(1260)*	2500 *(1371)*
Density, ASTM C 134					
lb/9" straight	2.17-2.52	2.3	1.86	2.2	2.3
(kg)	*(0.99-1.15)*	(1.1)	*(0.84)*	*(1)*	*(1.05)*
pcf	38-44	40	31-34	37	37-40
(kg/m^3)	*(609-705)*	(641)	*(497-529)*	*(593)*	*(593-641)*
Melting temperature,°F	2750 *(1510)*	2750 *(1510)*	2750 *(1510)*	2750 *(1510)*	2800 *(1538)*
Modulus of rupture, ASTM C 133					
psi	110-160	140	115	105	120
(Mpa)	*(0.75-1.03)*	(1.0)	*(0.79)*	*(0.72)*	*(0.83)*
Cold crushing strength, ASTM C 133					
psi	140-220	200	130	125	175
(Mpa)	*(0.97-1.52)*	(1.4)	*(0.90)*	*(0.86)*	*(1.21)*
Permanent linear change, %, per ASTM C 210					
@ 2250°F *(1232°C)*	-0.1 to -0.4	0.0	0	0	-
@ 2450°F *(1343°C)*	-	-	-	-	-0.1
Deformation under hot load, % @ 10 psi, ASTM C 16					
1½ hr @ 2000°F *(1093°C)*	-0.1 to -0.3	0	0	0	-
1½ hr @ 2200°F *(1204°C)*	-	-	-	-	-0.1
Coefficeint of thermal expansion					
in/in°Fx10^{-6}	3	-	3	-	3.1
Chemical Analysis, %					
Alumina, Al_2O_3	39-43	38.8	38.3	38.8	45
Silica, SiO_2	43-45	47.8	44.3	47.8	38
Ferric oxide, Fe_2O_3	0.4-0.6	0.4	0.3	0.4	0.2
Titanium oxide, TiO_2	1.5-1.9	1.6	1.6	1.6	1.6
Calcium oxide, CaO	10-12	10.9	15	10.9	14.5
Magnesium oxide, MgO	0.1-0.2	0.2	0.1	0.2	0.2
Alkalies, as, Na_2O and K_2O	0.4-0.7	0.3	0.4	0.3	0.5
Thermal Conductivity, BTU•in./hr•ft^2•°F *(w/m•k)*, ASTM C 201					
Mean temperature					
@ 500°F	1.1-1.2	*1.2*	0.95	1.0	1.12
(260°C)	*(0.16-0.17)*	*(0.17)*	*(0.13)*	*(0.14)*	*(0.16)*
@ 1000°F	1.3-1.4	1.5	1.18	1.3	1.28
(538°C)	*(0.19-0.20)*	(0.22)	*(0.17)*	*(0.18)*	*(0.18)*
@ 1500°F	1.6-1.7	1.7	1.45	1.6	1.46
(815°C)	*(0.23-0.25)*	(0.25)	*(0.21)*	*(0.23)*	*(0.21)*
@ 2000°F	1.75-1.9	2.0	1.74 *(0.25)*	1.8	1.65
(1093°C)	*(0.25-0.27)*	(0.29)	*(0.25)*	*(0.25)*	*(0.24)*

The values given herein are 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. Therefore, the data contained herein should not be used for specification purposes. Check with your Thermal Ceramics office to obtain current information.

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