Thermal Ceramics

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

K-20, K-23, K-25 IFB	casting
IFB 23 Tile	slinger

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Physical Properties	**K-20**	**K-23**	**IFB 23 Tile**	**K-25**
Recommended Hot Face temperature,°F *(°C)*	2000 *(1093)*	2300 *(1260)*	2300 *(1260)*	2500 *(1371)*
Melting temperature,°F (°C)	2750 *(1510)*	2750 *(1510)*	2750 *(1510)*	2800 *(1538)*
Density, avg (ASTM C 134)				
lb/9" straight, *(kg)*	1.86 *(0.84)*	1.86 *(0.84)*	2.2 *(1)*	2.3 *(1.05)*
pcf *(kg/m^3)*	31 *(497)*	31 *(497)*	37 *(593)*	40 *(641)*
Modulus of rupture, (ASTM C 133)				
psi *(Mpa)*	110 *(0.76)*	120 *(0.83)*	105 *(0.72)*	140 *(0.96)*
Cold crushing strength, (ASTM C 133)				
psi *(Mpa)*	125 *(0.86)*	135 *(0.93)*	125 *(0.86)*	220 *(1.52)*
Permanent linear change, % (per ASTM C 120)				
@ 1950°F *(1066°C)*	0	-	-	-
@2250°F *(1232°C)*	0	0	0	-
@2450°F *(1343°C)*	-	-	-	-0.1
Deformation under hot load, % @ 10psi (ASTM C 16)				
1½ hr @ 2000°F *(1093°C)*	0	0	0	-
1½ hr @ 2200°F *(1204°C)*	-	-	-	-0.1
Chemical Analysis, %, Nominal				
Alumina, Al_2O_3	38	38	38.8	45
Silica, SiO_2	43.6	43.6	47.8	38
Ferric oxide, Fe_2O_3	0.4	0.4	0.4	0.2
Titanium oxide, TiO_2	1.5	1.5	1.6	1.6
Calcium oxide, CaO	16	16	10.9	14.5
Magnesium oxide, MgO	0.1	0.1	0.2	0.2
Alkalies, as, Na_2O and K_2O	0.4	0.4	0.3	0.5
Thermal Conductivity, BTU•in./hr•ft^2•°F *(W/m•k)* ASTM C 201				
Mean temperature				
@ 500°F *(260°C)*	0.95 *(0.13)*	0.95 *(0.13)*	1.0 *(0.14)*	1.12 *(0.16)*
@ 1000°F *(538°C)*	1.18 *(0.17)*	1.18 *(0.17)*	1.3 *(0.18)*	1.28 *(0.18)*
@ 1500°F *(815°C)*	1.45 *(0.21)*	1.45 *(0.21)*	1.6 *(0.23)*	1.46 *(0.21)*
@ 2000°F *(1093°C)*	1.74 *(0.25)*	1.74 *(0.25)*	1.8 *(0.25)*	1.65 *(0.24)*

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