K®-23, TC™-23, IFB 23 Tile, K-25

Description

Thermal Ceramics was first to introduce insulating firebrick (IFB) to the industry in the 1930's. The K-IFB are manufactured with a unique slurry casting process which creates a network of microporosity that 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 high temperature firing and resultant anorthite mineralogy ($CaO \cdot Al_2O_3 \cdot 2\ SiO_2$) of these low temperature K-IFB gives them excellent strength at operating temperatures and resistance to corrosive alkali environments.

Features

- Extremely low thermal conductivity
- Low densities
- Low heat storage
- Good strength at room and high temperatures
- Excellent resistance to alkali attack

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

K®-23, TC™-23, IFB 23 Tile, K-25

Physical Properties	**K-23**	**TC-23**	**IFB 23 Tile**	**K-25**
Recommended Hot Face use limit,°F (°C)	2300 (1260)	2300 (1260)	2300 (1260)	2500 (1371)
Density, ASTM C 134				
lb/9" straight	1.9	1.8 - 2.0	2.2	2.3
(kg)	(0.86)	(0.82-0.91)	(1.0)	(1.05)
pcf	31 - 34	30 - 36	37	38 - 41
(kg/m^3)	(497-529)	(480 - 576)	(593)	(593-641)
Melting temperature,°F	2750 (1510)	2750 (1510)	2750 (1510)	2800 (1538)
Modulus of rupture, ASTM C 133				
psi	115	105 - 115	105	135
(Mpa)	(0.79)	(0.72 - 0.79)	(0.72)	(0.93)
Cold crushing strength, ASTM C 133				
psi	145	120 - 145	125	200
(Mpa)	(1.10)	(0.83 - 1.0)	(0.86)	(1.38)
Permanent linear change, %, per ASTM C 210				
@ 2250°F (1232°C)	0 to -0.1	-0.1 to -0.2	0	-
@ 2450°F (1343°C)	-	-	-	-0.3
Deformation under hot load, % @ 10 psi, ASTM C 16				
1½ hr @ 2000°F (1093°C)	0	0.1 - 0.2	0	0
1½ hr @ 2200°F (1204°C)	0.3	-	-	0.1
Coefficeint of thermal expansion				
$in/in°F x 10^{-6}$	3	3	-	3.1
Chemical Analysis, %				
Alumina, Al_2O_3	38	36 - 39	38.5	46
Silica, SiO_2	45	44 - 47	47.5	37.5
Ferric oxide, Fe_2O_3	0.3	0.3 - 0.5	0.4	0.3
Titanium oxide, TiO_2	1.6	1.6 - 1.8	1.6	1.4
Calcium oxide, CaO	15	14 - 15	11	14
Magnesium oxide, MgO	0.1	0.1	0.2	0.1
Alkalies, as, Na_2O and K_2O	0.5	0.5 - 0.7	0.3	0.4
Thermal Conductivity, BTU•in./hr•ft²•°F (w/m•k), ASTM C 201				
Mean temperature				
@ 500°F	0.95	0.95 - 1.0	1.0	1.06
(260°C)	(0.13)	(0.13 - 0.14)	(0.14)	(0.15)
@ 1000°F	1.16	1.2 - 1.3	1.3	1.22
(538°C)	(0.17)	(0.17 - 0.19)	(0.18)	(0.18)
@ 1500°F	1.41	1.5 - 1.6	1.6	1.38
(815°C)	(0.20)	(0.22 - 0.23)	(0.23)	(0.20)
@ 2000°F	1.68	1.7 - 1.9	1.8	1.54
(1093°C)	(0.24)	(0.24 - 0.27)	(0.25)	(0.22)

Standard Sizes*

9" x 4½" x 2½" (229mm x 114mm x 63mm)
9" x 4½" x 3" (229mm x 114mm x 76mm)
IFB 23 Tile
9" x 9" x 3" to 24½" x 9" x 3" (229mm x 229mm x 76mm to 622mm x 229mm x 76mm)

* Special sizes available upon request, including arch, wedge and key shapes.

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.