IFB up to 2600°F (1427°C) – K®-23, TC™-23, K-23-HS, K-25, K-26

Datasheet Code US: 1-14-3 Updated: 02/2016

Product Description

Thermal Ceramics K-IFB are manufactured with a unique slurry casting process, creating a network of micro porosity 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 amorthite 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. The K-23 HS IFB is amorthite-mullite composition which creates excellent resistant to alkali attacks.

K-23 is a 2300°F (1260°C) rated "flagship" IFB
- Low density
- High hot strengths with good thermal stability
- Ultra low thermal conductivity

TC-23 is a 2300°F (1260°C) rated economical IFB
- Properties close to K-23
- Slightly less appearance standard

K-23 HS is a 2300°F (1260°C) high strength IFB
- High ambient strength and hot load properties
- Excellent strength–to-density ratio

K-25 is a 2500°F (1371°C) rated IFB
- Low shrinkage at use limit
- Excellent insulation stability

K®-26 are 2600°F (1427°C) rated
- Low density and iron content
- Ultra low thermal conductivity

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 aluminium 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

Availability

Product	Straights, standard size, in (mm)
K-23 TC-23 K-23 HS K-25 K-26	9 x 4.5 x 2.5 (229 x 114 x 63)
K-23 TC-23 K-23 HS K-25 K-26	9 x 4.5 x 3 (229 x 114 x 76)
K-23 K-23 HS K-25 K-26	9 x 6 x 3 (229 x 152 x 76)
K-23 K-23 HS K-25 K-26	9 x 6.75 x 3 (229 x 171 x 76)
K-23 K-25 K-26	13.5 x 4.5 x 3 (343 x 114 x 76)

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IFB and Firebrick Product Name	K-23	TC-23	K-23 HS	K-25	K-26
Material Class	Crystalline Silica				
Physical Properties					
Color	off white	off white	off white	off white	off white
Hot Face use Temperature, °F	2300	2300	2300	2500	2600
Hot Face use Temperature, °C	1260	1260	1260	1371	1427
Melting Temperature, °F	2750	2750	2750	2800	3000
Melting Temperature, °C	1510	1510	1510	1538	1649
Coefficient of reversible thermal expansion, in/in•°F	3	3	-	3.1	-
Printed brick identifier	23	23	23	25	26
Density, ASTM C 134, pcf					
fired	33	33	44	41	43.5
lb/9 in straight	1.93	1.9	3.1	2.4	2.6
Density, ASTM C 134, kg/m^3					
fired	473-569	465-576	705	609-705	657-753
kg/229 mm straight	0.87	0.85	1.4	1.1	1.1
Modulus of Rupture, MOR, ASTM C 133, psi					
ambient	115	105	180	150	160
Modulus of Rupture, MOR, ASTM C 133, MPa					
ambient	0.79	0.72	1.24	1.03	1.1
Cold crushing strength, CCS, ASTM C 133, psi					
ambient	145	130	350	200	250
Cold crushing strength, CCS, ASTM C 133, MPa					
ambient	1.0	0.9	2.4	1.4	1.7
Deformation under hot load, ASTM C 16, 10 psi (0.07 MPa), %					
1.5 hrs @ 2000°F (1093°C)	0	0	-	0	-
1.5 hrs @ 2200°F (1204°C)	0.3	0.3	-	0.1	-
Permanent Linear Shrinkage, ASTM C 210, 24 hours, %					
2250°F (1232°C)	0 to -0.1	0 to -0.2	0 to -0.1	-	-
2450°F (1343°C)	-	-	-	-0.3	-0.2
2550°F (1400°C)	-	-	-	-	-0.8
Chemical Analysis, % weight basis after firing					
Alumina, Al_2O_3	38	38	38	46	48
Silica, SiO_2	45	45	48	3.7.5	37.5
Ferric Oxide, Fe_2O_3	0.3	0.3	0.6	0.3	0.3
Titanium Oxide, TiO_2	1.6	1.6	1.5	1.4	1.2
Calcium Oxide, CaO	15	15	11	14	13
Magnesium Oxide, MgO	0.1	0.1	0.1	0.1	0.1
Alkalies as Na_2O and K_2O	0.5	0.5	0.6	0.4	0.3
Thermal Conductivity, BTU•in/hr•ft^2, per ASTM C201					
Mean temperature @500°F	0.86	0.86	1.2	1.06	1.12
1000°F	1.08	1.08	1.4	1.22	1.28
1500°F	1.32	1.32	1.6	1.38	1.46
2000°F	1.57	1.57	1.9	1.54	1.65
2500°F	-	-	-	-	1.88
Thermal Conductivity, W/m•K, per ASTM C201					
Mean temperature @260°C	0.13	0.13	0.17	0.15	0.17
538°C	0.15	0.15	0.2	0.18	0.19
815°C	0.19	0.19	0.23	0.2	0.22
1093°C	0.23	0.23	0.27	0.22	0.25
1371°C	-	-	-	-	0.28