

Insulating Firebricks

Market leading brands JM[®], K[™], and TJM[®] Insulating Firebrick (IFBs), bring unsurpassed performance in a wide variety of markets and offer:

- Geographical manufacturing base
- Extensive range of manufacturing techniques
- Complete range of IFB temperature and mechanical properties
- Network of global distribution
- Experienced team dedicated to IFB technical support in the industry

Insulating Firebricks, features include:

- Excellent strength at ambient and elevated temperatures
- High compressive strength
- Every brick ground to precise dimensions
- Very low levels of iron and other impurities (especially for resistance to reducing atmosphere conditions)
- Lower heat storage than denser refractories
- Available in custom designed shapes upon request

Insulating Firebricks, benefits include:

- Energy saving benefits
- Lower operating costs
- Lightweight, energy-saving nature results in less heat loss and allows for opportunity of thinner furnace linings

Insulating Firebricks (IFBs) are well established products for solving many problems of high temperature heat containment in industries ranging from ceramic production kilns to anodes for primary aluminium.



Physical characteristics

- High temperature use limit up to 1650°C (3000°F)
- Bubble Alumina IFB up to 1800°C (3300°F)
- Extremely low thermal conductivity
- Low densities and heat storage
- Excellent resistance to alkali attack
- High purity
- Good strengths
- Low shrinkage

Applications

- Aluminium anode bake furnaces, primary electrolytic cells, holding and melting furnaces and secondary remelt furnaces
- Petrochemical heaters, flues, refining vessels and reactor chambers
- Iron and steel industry, hot blast furnace stoves, hot blast main and bustle pipe, heat treatment and galvanizing furnaces
- Metals, heat treatment and atmosphere furnaces
- Ceramic industry, including kilns for domestic and laboratory use
- Glass industry
- Hot Face and Backup insulation in industrial furnaces

Brands

- K IFB range manufactured in our Americas region
- JM IFB range manufactured in our EMEA region
- TJM IFB range manufactured in our Asia region
- Insalcor[®]

JM[®] Insulating Firebricks (IFB)

Properties	JM 23 IFB	JM 25 IFB	JM 26 IFB	JM 28 IFB	JM 30 IFB	JM 30HA IFB	JM 26HD IFB
Region of Manufacture	EMEA	EMEA	EMEA	EMEA	EMEA	EMEA	EMEA
ISO 2245 Classification	I25 0.5L	-	I40 0.8L	I50 0.9L	I60 1.0L	-	-
Classification Temperature, °C (°F)	1260 (2300)	1350 (2450)	1430 (2600)	1540 (2800)	1650 (3000)	1650 (3000)	1400 (2600)
Brick markings	23	25	26	28	30	30 HA	26-HD
Density, kg/m ³ (pcf), ASTM C134	480 (29.9)	770 (48.0)	800 (49.9)	890 (55.5)	1020 (63.6)	1250 (78.0)	920 (57.4)
Modulus of rupture, MPa (psi), ASTM C133	1 (145)	1 (145)	1.5 (217.5)	1.8 (261)	2 (290)	2.1 (304.6)	2.2 (319)
Cold Crushing strength, MPa (psi), ASTM C133	1 (145)	1.3 (188.5)	1.6 (232)	2.1 (304.5)	2.3 (333.5)	3.2 (464.1)	3.5 (507.5)
Reversible Linear Thermal Expansion, max. %	0.5	0.4	0.5	0.6	0.6	-	-
Linear Shrinkage, % after 24 hours soaking, ASTM C210							
1230°C (2246°F)	-0.4	-	-	-	-	-	-
1290°C (2354°F)	-	-0.2	-	-	-	-	-
1400°C (2552°F)	-	-	-0.2	-	-	-	-0.3
1510°C (2750°F)	-	-	-	-0.4	-	-	-
1620°C (2948°F)	-	-	-	-	-0.6	±0.1	-
Chemical Analysis, %							
Alumina, Al ₂ O ₃	37	58	58	67.1	71.5	79.7	58
Silica, SiO ₂	45.5	38	38.8	30.0	26.9	18.0	38.8
Iron Oxide, Fe ₂ O ₃	0.9	0.9	0.8	0.6	0.5	0.40	0.8
Titania, TiO ₂	0.5	0.4	0.3	0.5	0.4	0.3	0.3
Lime, CaO	15.2	0.2	0.1	0.1	0.2	0.1	0.1
MgO + Na ₂ O + K ₂ O	1.9	1.8	1.9	1.0	0.8	0.7	1.9
Thermal Conductivity, W/m•K, ASTM C-182							
400°C	0.14	0.24	0.25	0.3	0.36	0.47	0.33
600°C	0.16	0.25	0.27	0.32	0.37	0.48	0.35
800°C	0.17	0.27	0.3	0.34	0.37	0.49	0.37
1000°C	0.19	0.3	0.33	0.36	0.38	0.5	0.39
1100°C	-	-	0.33	0.36	0.39	0.51	-
1200°C	-	-	-	-	0.39	-	-
Thermal Conductivity, BTU•in/hr•ft ² •°F, ASTM C-182							
752°F	0.97	1.67	1.73	2.08	2.50	3.26	2.29
1112°F	1.11	1.73	1.87	2.22	2.57	3.33	2.43
1472°F	1.18	1.87	2.08	2.36	2.57	3.40	2.57
1832°F	1.32	2.08	2.29	2.50	2.64	3.47	2.70
2012°F	-	-	2.29	2.50	2.71	3.54	-

KTM Insulating Firebricks (IFB)

Properties	K 23 IFB	K 25 IFB	K 26 IFB	Insalcor
Region of Manufacture	Americas	Americas	Americas	Americas
ISO 2245 Classification	-	-	-	180 I.3L
Classification Temperature, °C (°F)	1315 (2400)	1370 (2500)	1430 (2600)	1790 (3250)
Brick markings	23	25	26	-
Density, kg/m ³ (pcf), ASTM C134	513 (32.0)	617 (38.5)	657 (41.0)	1314 (82.0)
Modulus of rupture, MPa (psi), ASTM C133	0.79 (114.5)	0.95 (137.7)	0.9 (130.5)	2.4 (350)
Cold Crushing strength, MPa (psi), ASTM C133	1 (145)	1.3 (188.5)	1.3 (188.5)	6.9 (1000)
Reversible Linear Thermal Expansion, max. %	0.7	0.8	0.8	1.2
Linear Shrinkage, % after 24 hours soaking, ASTM C210				
1230°C (2246°F)	-0.1	-	-	-
1350°C (2462°F)	-	-0.3	-	-
1400°C (2552°F)	-	-	-1.0	-
5 hours, 1730°C (3146°F)	-	-	-	0.4
Chemical analysis, %				
Alumina, Al ₂ O ₃	38.3	47	51	77
Silica, SiO ₂	44.3	38	35	21
Iron Oxide, Fe ₂ O ₃	0.3	0.2	0.4	0.4
Titania, TiO ₂	1.6	1.4	1.4	0.6
Lime, CaO	15	13.5	11.0	0.1
MgO + Na ₂ O + K ₂ O	0.5	0.5	0.4	0.4
Thermal Conductivity, W/m•K (ASTM C-182)				
260°C	0.13	0.15	0.2	0.79
540°C	0.17	0.18	0.23	0.8
815°C	0.2	0.2	0.26	0.91
1100°C	0.24	0.22	0.29	1.09
1370°C	-	-	0.31	1.33
Thermal Conductivity, BTU•in/hr•ft ² •°F (ASTM C-182)				
500°F	0.90	1.04	1.39	5.48
1004°F	1.18	1.25	1.60	5.55
1499°F	1.39	1.39	1.80	6.31
2012°F	1.67	1.53	2.01	7.56
2498°F	-	-	2.15	9.23

TJM[®] Insulating Firebricks (IFB)

Properties	TJM 23 IFB	TJM 26C IFB	TJM 26 IFB	TJM 28 IFB	TJM 30 IFB
Region of Manufacture	Asia	Asia	Asia	Asia	Asia
Classification Temperature, °C (°F)	1260 (2300)	1400 (2550)	1430 (2600)	1540 (2800)	1650 (3000)
Brick markings	TJM-23	TJM-26C	TJM-26	TJM-28	TJM-30
Density, kg/m ³ (pcf), ASTM C134	530 (33.1)	800 (49.9)	800 (49.9)	900 (56.2)	1000 (62.4)
Modulus of rupture, MPa (psi), ASTM C133	0.7 (101.5)	1.2 (174)	1.5 (217.5)	1.8 (261)	2.0 (290)
Cold Crushing strength, MPa (psi), ASTM C133	1.0 (145)	1.8 (261)	2.0 (290)	2.5 (362.5)	3.0 (435)
Reversible Linear Thermal Expansion, max. %	0.6	0.7	0.7	0.8	0.9
Linear Shrinkage, % after 24 hours soaking, ASTM C210					
1230°C (2246°F)	-0.2	-	-	-	-
1350°C (2462°F)	-	-0.5	-	-	-
1400°C (2552°F)	-	-	-0.5	-	-
1510°C (2750°F)	-	-	-	-0.5	-
1570°C (2858°F)	-	-	-	-	-1.0
Chemical Analysis, %					
Alumina, Al ₂ O ₃	45	50	55	65	73
Silica, SiO ₂	48	45	41	32	25
Iron Oxide, Fe ₂ O ₃	1.0	0.9	0.9	0.7	0.6
Titania, TiO ₂	0.8	0.6	0.5	0.4	0.2
Lime, CaO	0.8	0.4	0.4	0.3	0.1
Magnesia, MgO	0.5	0.2	0.2	0.1	0.1
Alkalies as, Na ₂ O + K ₂ O	1.2	-	0.9	0.8	0.7
Thermal Conductivity, W/m•K (ASTM C-182)					
200°C	0.16	0.25	0.28	0.32	0.36
400°C	0.18	0.27	0.29	0.33	0.38
600°C	0.22	0.29	0.32	0.34	0.41
800°C	0.25	0.32	0.35	0.37	0.43
1000°C	0.29	0.36	0.39	0.41	0.45
1200°C	-	-	0.43	0.46	0.48
Thermal Conductivity, BTU•in/hr•ft ² •°F (ASTM C-182)					
392°F	1.11	1.73	1.94	2.22	2.50
752°F	1.25	1.87	2.01	2.29	2.64
1112°F	1.53	2.01	2.22	2.36	2.84
1472°F	1.73	2.22	2.43	2.57	2.98
1832°F	2.01	2.50	2.71	2.84	3.12
2192°F	-	-	2.98	3.19	3.33

TJM[®] Insulating Firebrick (IFB)

Properties	TJM B5 IFB	TJM C1 IFB	TJM B6 IFB	TJM C2 IFB	TJM B7 IFB
Region of Manufacture	Asia	Asia	Asia	Asia	Asia
Classification Temperature, °C (°F)	1300 (2400)	1300 (2400)	1430 (2600)	1430 (2600)	1540 (2800)
Brick markings	TJM-B5	TJM-C1	TJM-B6	TJM-C2	TJM-B7
Density, kg/m ³ (pcf), ASTM C134	800 (49.9)	1000 (62.4)	800 (49.9)	1100 (68.6)	900 (56.2)
Modulus of rupture, MPa (psi), ASTM C133	1.2 (174)	2.1 (304.5)	1.8 (261)	2.5 (362.5)	2.0 (290)
Cold Crushing strength, MPa (psi), ASTM C133	2.2 (319)	3.5 (507.5)	2.5 (362.5)	4.0 (580)	3.5 (507.5)
Reversible Linear Thermal Expansion, max. %	0.7	0.7	0.7	0.7	0.8
Linear Shrinkage, % after 24 hours soaking, ASTM C210					
1300°C (2372°F)	-0.5	-0.5	-	-	-
1400°C (2552°F)	-	-	-0.5	-0.5	-
1500°C (2732°F)	-	-	-	-	-0.5
Chemical Analysis, %					
Alumina, Al ₂ O ₃	45	45	55	55	65
Silica, SiO ₂	50	49	41	41	32
Iron Oxide, Fe ₂ O ₃	1.0	0.9	0.9	0.9	0.8
Titania, TiO ₂	0.6	-	-	-	-
Lime, CaO	0.5	-	-	-	-
Magnesia, MgO	0.2	-	-	-	-
Alkalies as, Na ₂ O + K ₂ O	1.0	1.0	0.9	1.0	0.8
Thermal Conductivity, W/m•K, ASTM C-182					
200°C	0.24	0.28	0.28	0.34	0.32
400°C	0.26	0.30	0.29	0.36	0.33
600°C	0.28	0.34	0.32	0.38	0.34
800°C	0.30	0.38	0.36	0.42	0.38
1000°C	0.34	0.42	0.40	0.46	0.42
Thermal Conductivity, BTU•in/hr•ft ² •°F, ASTM C-182					
392°F	1.67	1.94	1.94	2.36	2.22
752°F	1.80	2.08	2.01	2.50	2.29
1112°F	1.94	2.36	2.22	2.64	2.36
1472°F	-	-	2.50	2.91	2.64
1832°F	2.36	2.91	2.78	3.19	2.91

TJM[®] Bubble Alumina Insulating Firebrick (IFB)

Properties	TJM Ba90 IFB	TJM Ba95 IFB	TJM Ba99 IFB	TJM Ba99A IFB
Region of Manufacture	Asia	Asia	Asia	Asia
Classification Temperature, °C (°F)	1760 (3200)	1760 (3200)	1800 (3300)	1800 (3300)
Brick markings	TJM-Ba90	TJM-Ba95	TJM-Ba99	TJM-Ba99A
Density, kg/m ³ (pcf), ASTM C134	1400 (87.4)	1400 (87.4)	1400 (87.4)	1400 (87.4)
Modulus of rupture, MPa (psi), ASTM C133	6 (870)	4.5 (652.5)	3.5 (507.5)	3.5 (507.5)
Cold Crushing strength, MPa (psi), ASTM C133	18 (2610)	15 (2175)	10 (1450)	10 (1450)
Reversible Linear Thermal Expansion, max. %	1.2	1.2	1.3	1.3
Linear Shrinkage, % after 24 hours soaking, ASTM C210				
5 hours, 1600°C (2912°F)	-0.3	-0.3	-0.2	-0.2
Chemical Analysis, %				
Alumina, Al ₂ O ₃	92	97	99	99.2
Silica, SiO ₂	7	2	0.3	0.2
Iron Oxide, Fe ₂ O ₃	0.1	0.1	0.1	0.1
Titania, TiO ₂	0.2	0.1	0.1	0.1
Lime, CaO	0.1	-	trace	trace
Magnesia, MgO	0.1	0.1	trace	trace
Alkalies as, Na ₂ O + K ₂ O	0.3	0.2	0.2	0.2
Thermal Conductivity, W/m•K, ASTM C-182				
200°C	0.70	0.70	0.70	0.70
400°C	0.75	0.75	0.75	0.75
600°C	0.80	0.80	0.80	0.80
800°C	0.90	0.90	0.90	0.90
1000°C	0.90	0.90	0.90	0.90
Thermal Conductivity, BTU•in/hr•ft ² •°F, ASTM C-182				
392°F	4.86	4.86	4.86	4.86
752°F	5.20	5.20	5.20	5.20
1112°F	5.55	5.55	5.55	5.55
1472°F	6.24	6.24	6.24	6.24
1832°F	6.24	6.24	6.24	6.24

High Alumina Firebricks

The SR-90 and SR-99 Firebricks are premium high alumina firebricks that are capable of handling very difficult applications.

These premium bricks are very dense and have excellent load bearing strength at temperatures above 1649°C (3000°F) and they provide excellent thermal shock resistance. The extremely low silica content of both products make them ideal for hydrogen atmospheres.

Physical characteristics

- High temperature use limit up to 1800°C (3250°F)
- Excellent strength and thermal stability
- Good thermal shock resistance
- Low SiO₂ contents for use in Hydrogen atmospheres

Applications

- Sulphur recovery units
- Incinerators
- Secondary ammonia reformers

Brands

- SR™



SR™ Firebrick

Properties	SR-90	SR-99
Region of Manufacture	Americas	Americas
Color	White	White
Hot Face use Temperature, °C (°F)	1704 (3100)	1760 (3200)
Melting Temperature, °C (°F)	1915 (3480)	2016 (3660)
Porosity, ASTM C 20, %	14 - 22	12 - 19
Permeability, ft ³ /hr•ft ² •in/psi	35	30
Abrasion loss, cm ³ , ASTM C 704	5 - 10	-
Density, kg/m ³ (pcf), ASTM C 134		
	fired	2708 - 3029 (169 - 189)
	kg/229 mm straight (lb/9 in straight)	4.7 (10.4)
		2885 - 3205 (180 - 200)
		5.1 (11.3)
Modulus of Rupture, MOR, MPa (psi), ASTM C 133		
	ambient	8.3 - 19.3 (1200 - 2800)
		9.7 - 27.6 (1400 - 4000)
Cold crushing strength, CCS, Mpa (psi), ASTM C 133		
	ambient	34.5 - 96.5 (5000 - 14000)
		34.5 - 96.5 (5000 - 14000)
Deformation under hot load, ASTM C 16, 10 psi (0.07 MPa), %		
	1.5 hrs @ 2800°F (1538°C)	+0.5 to -1.0
		0 to -2.0
Permanent Linear Change, ASTM C 210, 24 hours, %		
	3000°F (1649°C)	-0.1 to +0.4
	5 hrs @ 3200°F (1760°C)	1.5
		-
Chemical Analysis, %		
	Alumina, Al ₂ O ₃	90.3
	Silica, SiO ₂	9.1
	Iron Oxide, Fe ₂ O ₃	0.1
	Titania, TiO ₂	trace
	Lime, CaO	0.1
	Magnesia, MgO	0.1
	Alkalies as, Na ₂ O + K ₂ O	0.2
		0.2
Thermal Conductivity, W/m•K (BTU•in/hr•ft ² •°F), ASTM C201		
	260°C (500°F)	3.55 (24.6)
	538°C (1000°F)	3.1 (21.5)
	815°C (1500°F)	2.8 (19.4)
	1093°C (2000°F)	2.55 (17.7)
	1371°C (2500°F)	2.38 (16.5)
		5.61 (38.9)
		4.42 (30.7)
		3.68 (25.5)
		3.11 (21.6)
		2.75 (19.1)