CIMM Group(China Industrial Minerals & Metals Group)

CIMM Group is the founder, major shareholder, exclusive export window and chief financer for a Group of Manufacturer, Construction company and Design& Engineering institute, focusing on manufacturer and supply, design and erection, Installation and commissioning through his own integrated sources and his own collective channels to the world metallurgical industry.

CIMM Group is a group of companies. CIMM has his own magnesia mines, heavy machinery plants, shipping lines, research and development centers and design and engineering units. Owning a number of patented technologies and know-hows and having shares with the leading research institutes all over China

CIMM Group has been professionally engaging in the domestic and international technology transfer and trade of research & development, project engineering & design, project contracting and construction, project supervision, project system matching, erection & commissioning, equipments manufacturing and installing, machinery & spare parts and raw material in the fields of Mining & Beneficiation, Ferrous & Nonferrous Metallurgy, Power & Transmission, Oil & Gas, Refinery & Petrochemical, Cement & Construction materials and Port & Shipbuilding etc.

THE SPIRIT OF CIMM GROUP

Quality

Integrity

Harmony

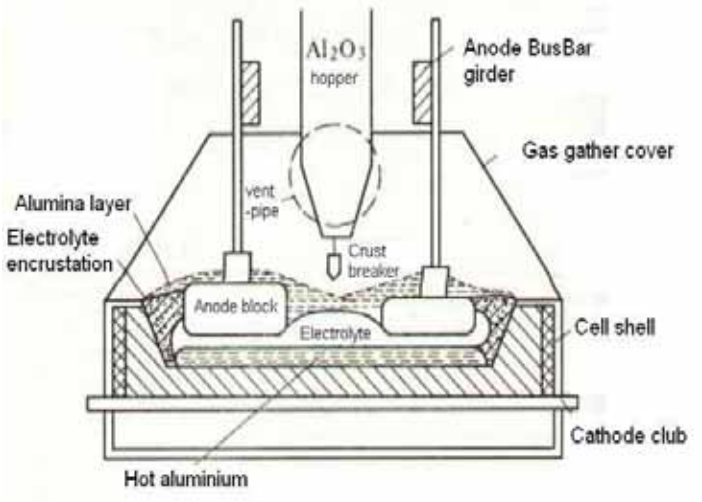
Innovation

Your success is our Goal. We at CIMM Group are all committed to guarantee all of our customers, traders, authorised agents, commissioners and suppliers must obtain substantial benefit and development from the longterm cooperation and partnership with us.

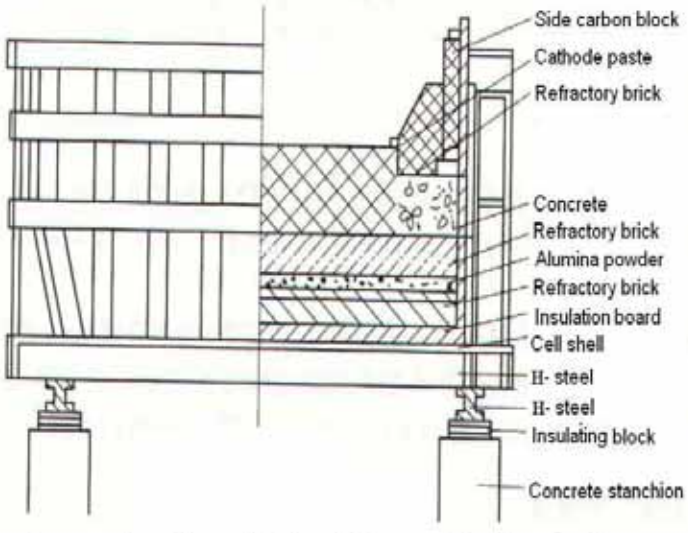
—Group Chairman: ***Mark Shujun Ma***

OUR STRENGTH FOR ALUNIMIUM INDUSTRY

- Mall for most of the raw materials, products, machines and equipments, engineering and consultancy required by the ALUMINIUM markets in China,
- Strong Financing Capability of procurement and merger of the Aluminium industry related producers all over China,
- Strong technical backup in China: Guiyang Light metals Research Institute;
  Guiyang Aluminium Magnesium Design & Research Institute;
  Shengyang Aluminium Magnesium Design & Research Institute
- Shareholding in our key products plants and selling exclusively for these products in certain markets and to some certain customers.
- Advanced technology and largest supplier and exporter for CPC, ECA, ANODES, CATHODES, INSULATION BRICKS, SiC BLOCKS etc...
- A team of well-experienced engineers provides free and timely technical and application service to our customers.
- FREE “Fit-you” engineering and consultancy for refractory lining and related products,
- Best quality CPC, ECA and pitch for production of anodes and cathodes.
- Total Quality Control System for all products both produced by CIMM shareholding companies and outsourced by CIMM integrated group procurement.
- Our plants location near to the places where there are abundance raw materials for producing our production, so we can provide competitive price and high quality.
- We can produce & supply productions according to the specific index and drawings of all customers.



Aluminium Reduction Cell



Inner structure of Aluminium reduction cell

REFERENCE LIST OF PRODUCTS FOR ALUMINIUM INDUSTRY

SN.	Customers	Cell	Products	Quantity/MT	Year
1	ALRO	180KA	Cathode block	156No.s	2002
2	BALCO	320ka	Diatom Insulation brick; Fireclay Insulation brick; Mullite Insulation brick	1730	2004
3	BALCO		Prebaked Anode	1500	2005
4	BALCO		Diatomite Insulation brick	51	2006
5	MALCO	190KA	Cathode Carbon Block	140	2004-2005
6	MALCO		ECA Coal	20	2005
7	MALCO		Calcined Petroleum Coke	3050	2005-2006
8	NALCO		Calcined Petroleum Coke	15000	2005-2006
9	S. Africa	240KA	Silicon Nitride bonded Silicon Carbon Block	60000 piece	2003-2005
10	Rusal	190KA	Diatom Insulation brick	2000	96-2002
11	Tomago		Diatom Insulation brick	1500	99-2005
12	Durban-REFMEX TRADING		Silicon Carbide brick	3500	2006
13	ADG		Low Creep Clay Bricks	21(2740piece)	2006
14	IRAN CARBIDE		Cathode block	267Nos	2006
15	ITSS(Bahrain)		Calcined Petroleum Coke(Carburant)	76	2004-2005
16	Rusal	190	Diatomite Insulation brick;Low creeep clay brick	203	2005
17	Ukraine		Diatomite Insulation brick	152	2004
18	Morocco -SEDRIC		Diatomite insulation bricks(0.5,0.6,0.7a)	685	2005.12
19	Taiwan liji co.,ltd.		Diatomite insulation bricks(0.5,0.4,0.7a);Diatomite light castable	220	2006.05
20	Japan		**Calcium Silicate board**	1000	2004-2005
21	Korea		**Calcium Silicate board**	940	2005
22	Jilin Carbon plant		Diatomite insulation bricks;Diatomite light castable	185	2006
23	Liaoyang Shoushan carbon plant		Diatomite insulation bricks ;Fireclay bricks;Diatomite light castable	345	2005
24	Shanxi guanlv aluminium group	200KA	Diatomite insulation bricks(0.6a,0.7a);Fireclay insulation bricks	213	2006
25	Qinghai Aluminum Co.Ltd	**160/200KA**	**Calcium Silicate board**	500	2004
26	TONGCHUAN XINGGUANG ALUMINIUM LTD.		**Calcium Silicate board**	500	2005
27	Yunkuang Aluminum Co.Ltd	**240KA**	**Calcium Silicate board**	420	2004
28	Sichuan phosphor Aluminum Co.Ltd	**200KA**	**Calcium Silicate board**	48	2006
29	Henan Qinyang Aluminum Co. Ltd	**160KA**	**Calcium Silicate board**	52	2005
31	Yichang Changjiang Aluminum Co.Ltd	**115KA**	**Calcium Silicate board**	180	2006
32	Henan jiaozuo Aluminum Co. Ltd	**280KA**	**Calcium Silicate board**	2000	2005-2006
33	Guan Aluminium Co.	300KA	Silicon Nitride bonded Silicon Carbon Block	247	2002
35	Guan Aluminium Co.	300KA	Silicon Nitride bonded Silicon Carbon Block	283	2003
36	Henan Shenhuo Group	300KA	Silicon Nitride bonded Silicon Carbon Block	410	2003
37	Lanzhou Liancheng Aluminum Co.,Ltd	200KA	Cathode Carbon Block	450*515*3250 Bottom&Sidewall	
38	Sichuan Guangyuan Qimingxing Aluminum Co.,Ltd	200KA	Cathode Carbon Block	400*400*2690 Bottom&Sidewall	
40	Dengfeng Power Group	160KA	Cathode Carbon Block	450*515*3240 Bottom&Sidewall	
41	Jiaozuo Wanfang Aluminium Co.,Ltd	280KA	Cathode Carbon Block	450*515*3250 Bottom&Sidewall	
42	Shanxi Huaze Aluminum Co.,Ltd	200KA	Cathode Carbon Block	450*515*3250*3180	

CONTENT

Prebaked Anode

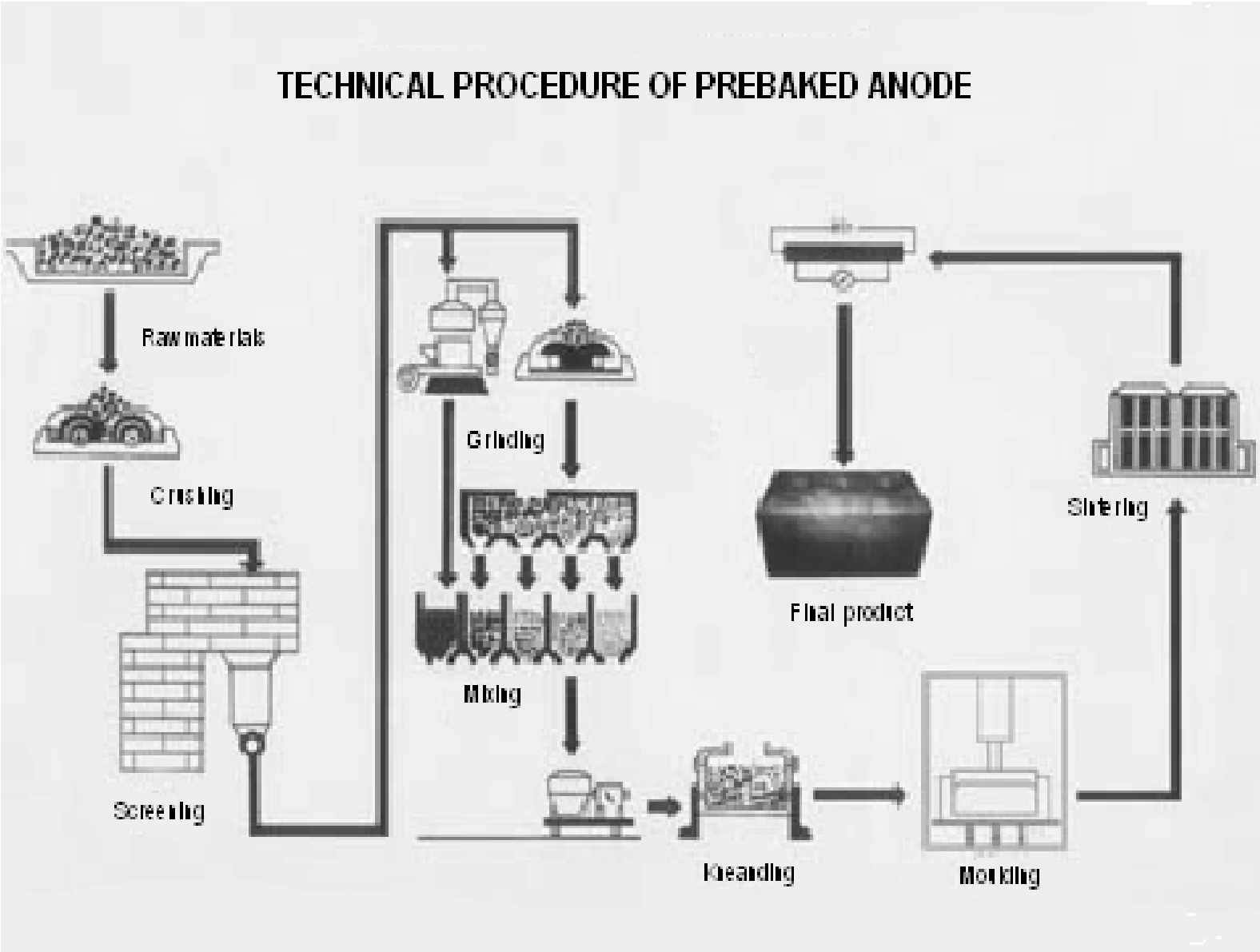
PREBAKED ANODE BLOCK FOR ALUMINIUM ELECTROLYSIS

Prebaked anode is made from the qualified petroleum coke and coal tar pitch through advanced technological process including mixing, vibrating and press forming, high-temperature baking process.

This Product has following features:

- Low ash
- Low electrical resistivity
- High strength.

--Technical procedure of Prebaked Anode



Prebaked Anode

--Raw Materials-Calcined Petroleum Coke

Calcined Petroleum Coke (CPC) is calcined by raw petroleum coke at high temperature(1200℃～1350℃) and isolation air condition to eliminate the volatile matter and its performances such as thermal expansion resistance, density, conductivity, machine strength and anti-oxidation and so on are evidently improved.

Base upon experts' analysis we know that Chinese oil base low sulfur and microelement contents, so that the calcined petroleum coke handled by Chinese oil has low sulfur, metasl and ash contents and the total quality of the Chinese coke is much better than imports.

Calcined Petroleum Coke is used as main materials of carbon anode for Al-smelting and artificial graphite products. Except that it is also used as carburant in steel-smelting furnace, reductant of carborundum, silicon and phosphorus furnace.

Properties of Calcined Petroleum Coke

Parameter	Unit	Guaranteed Value	Typical value
Ash	%	0.5 Max	0.3-0.5
Moisture	%	0.5 Max	0.4-0.5
Volatile Matter	%	0.5 Max	0.4-0.5
Sulfur	%	2.0 Max	2.0-0.3
Fixed Carbon	%	98.5 Min	98.5-99.0
Real Density	gm/cc	2.00-2.10	2.03-2.08
Electrical Resistivity	μΩcm	620max	600-400
Parameter	Unit	Reference value	-
Iron	%	500ppm Max	-
Silicon	%	500ppm Max	-
Titanium	%	40ppm Max	-
Vanadium	%	250ppm Max	-
Nickel	%	350ppm Max	-
Sodium	%	200ppm Max	-
Calcium	%	300ppm Max	-
Phosphor	%	30ppm Max	-

Prebaked Anode

-- Properties of Prebaked Anode

Prebaked Anode For Aluminium Electrolysis YB/T285-1998

Item	Ash /%	Electrical Resistivity/μΩ.m	Thermal expansion %	Co_2 reactivity /mg/(cm^3·h)	Compressive strength/ MPa	Bulk density/ g/cc	Real density / g/cc
	No more than				No less than		
TYPE-1	0.50	55	0.45	45	32	1.50	2.00
TYPE-2	0.80	60	0.50	50	30	1.50	2.00
TYPE-3	1.00	65	0.55	55	29	1.48	2.00

A Typical Test Result by R&D Testing Method

Properties	unit	Typ.value	Mean value	n
Apparent density baked	Kg/dm^3	1.530-1.580	1.62	8
Specific electrical resistance	μ Ω.m	52-60	53	8
Flexural strength	MPa	8.0-12.0	11.6	4
Compression strength	MPa	32.0-48.0	51.9	8
Static elasticity modulus	GPa	4.0-5.5	4.7	8
Thermal expansion coefficient	10^{-6}/k	3.75-4.50	4.26	8
Fracture energy	J/m^2	250-300	187	4
Thermal conductivity	w/m・k	3.00-4.50	4.62	8
Density in XYlens	Kg/dm^3	2.050-2.080	2.098	8
Air permeability	nPm	0.50-1.50	0.57	8
CO_2 reactivity residus	%	84.0-92.0	91.7	8
dust	%	2.0-6.0	10	8
loss	%	6.0-10.0	7.3	8
Air reactivity residus	%	70.0-85.0	90.7	8
dust	%	4.0-8.0	1	8
loss	%	10-24.0	8.3	8
Elements S	%	1.20-2.40	0.94	8
V	ppm	80-260	79	8
Ni	ppm	80-160	80	8
Si	ppm	100-300	70	8
Fe	ppm	100-500	260	8
Al	ppm	100-600	176	8
Na	ppm	200-600	84	8
Ca	ppm	50-200	55	8
K	ppm	5-30		
Mg	ppm	10-50		
F	ppm	100-400	10	8
Zn	ppm	10-50	20	8
Pb	ppm	10-50	14	8

Cathode blocks

CATHODE CARBON BLOCK FOR ALUMINIUM ELECTROLYSIS

Carbon block is produced by advanced technology process, advanced equipments and high quality electric calcined anthracite as raw material. It can be processed by vibrating-moulding machine. This product has features of good compact construction, high strength, heat resistantce, sodium corrosion resistance, low heat expansion coefficient and advantage of extending lifetime of the electrolytic cell. This product also has a feature of low electrical resistivity.

This kind of product can be used for wall, bottom, angle as liner of aluminium electrolytic cell, special suitable for expanding capacity of electrolytic cell.

The external form of the carbon block is machined by milling machine and diamond band saw. It has a standard of external shape and advantage of high precision.

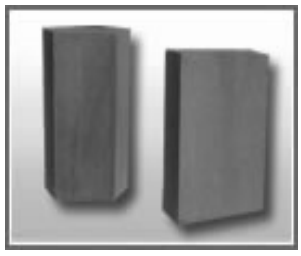
--Properties of Cathode Blocks

Cathode Blocks with different carbon contents For Aluminium Electrolysis

Item			30%	50%	75%	100%
ash	%	≤	4	3	2.5	1.5
resistivity	μ Ωm	≥	35	30	25	21
Na-expansion	%	≤	0.8	0.8	0.50	0.50
Real density	g/cm3	≥	1.94	1.96	2.00	2.10
Bulk density	g/cm3	≥	1.56	1.58	1.60	1.65
c.c.p.	Mpa	≥	27	26	25	25
Folding strength	Mpa	≥	8	8	7	7
Thermal conductivity	W/m° k	≥	8	14	18	20
Porosity	%	≤	20	20	20	20

Side & Corner blocks For Aluminium Electrolysis

Item			values
ash	%	≤	8
Real density	g/cm3	≥	1.88
Bulk density	g/cm3	≥	1.54
c.c.p.	Mpa	≥	30

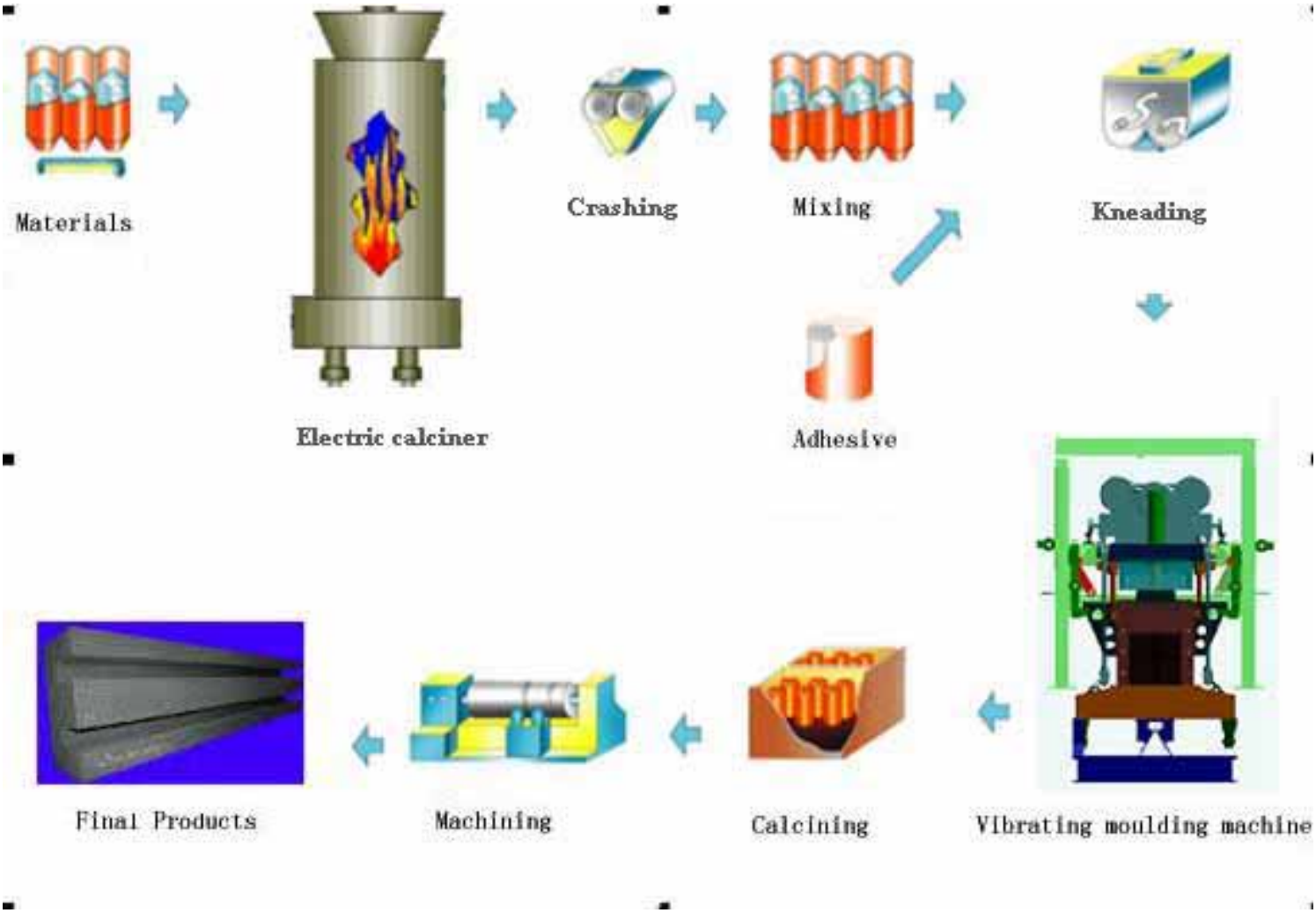


Dimensions of Cathode blocks

Item	Length	Width	Height	Slot
Maximum dimensions	4000 mm	950mm	500 mm	-
Standard tolerances	±5 mm	±3 mm	±3 mm	±3 mm

Cathode blocks

--Technical Procedure of Cathode carbon blocke



--Raw Materials-Electrical Calcined Anthracite (ECA)

We used the best quality anthracite as raw materials through high temperature calcined at over 2000℃ by the DC electric calciner with results in eliminating the moisture and volatile matter from anthracite efficiently, improving the density and the electric conductivity and strengthening the mechanical strength and anti-oxidation. It has good characteristics with low ash, low resistivity, low sulphur,high carbon and hign density.

It is the best material for high quality carbon products.

Properties of Electrical Calcined Anthracite

F.C.	Ash	V.M.	Moisture	Sulfur	Real density	Electric resistivity
%	%	%	%	%	g/cc	μΩcm
93max	5max	1max	1max	1.0max	1.82min	650max

Paste Materials

ANODE PASTE FOR ALUMINIUM ELECTROLYSIS

It was made of delayed petroleum coke and coal tar pitch which was mixed and kneaded in the kneader, as raw materials.It is stable in quality with the features of low ash, good conductivity of electricity, strong mechanical strength, oxidation-resistant,etc..It is mainly used in the self-baked electrolysis cell of either side-inserting or top-inserting.It is shaped like a trapezium block which is black and weight 15kg.It can also be small piece of block.

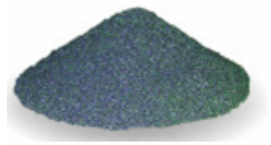
ITEM	THY-1	THY-2	THY-3	Typical
Ash,% ≤	0.45	0.60	1.00	0.48
Electrical resistivity,m^2/m ≤	75	80	80	72
Compressive strength,Mpa ≥	28	27	27	34
Apparent Density,g/cc ≥	1.38	1.36	1.36	1.40
Real density,g/cc ≥	1.98	1.98	1.98	1.99

CATHODE PASTE FOR ALUMINIUM ELECTROLYSIS

The paste quality is guaranteed by using the best hard coal (ash <5%,Sulfur<0.5%)and high-temperature improved pitch, with scientific proportion and strict manufacture and inspection. It can be used for all kinds of cell in various conditions. It has characters of the environmental protection and easy construction.


Surrounding paste


Carbon space paste


Steel rod paste

--Properties of Cathode paste

Item	BSZH	BSTH	BSGH	BSTN	PTLD Ⅰ	PTLD Ⅱ
Ash,% ≤	7	7	4	5	12	10
Resistivity,μΩ·m ≤	73	73	73	—	95	90
Volatility,%	7—11	8—12	9—13	≤50	≤12	≤10
Compressive strength, Mpa ≥	17	18	25	—	18	20
Bulk density, g/cm3 ≥	1.44	1.42	1.44	—	1.42	1.42
Real density ,g/cm3 ≥	1.87	1.86	1.87	—	1.84	1.84
Construction temp.,℃	110±10	110±10	110±10	60 ±10	25-50	40-60

--Usage and Temperature to Ram for Cathode Paste

Trade mark & Name	Locations to be used	Temperature to Ram°C
BSZH-Surrounding Paste	Used to fill the gaps between cathode and side block,between cathode blocks and refractory bricks	110±10
BSTH-Carbon Space Paste	Used to fill the gaps betweens cathode blocks	110±10
BSGH-Steel Rod Paste	Used to fill the gaps between steel bars and cathode blocks	110±10
BSTH-Carbon Clay	Used to fill the seams between side blocks	110±10
PTLD Ⅰ-Ordinary Cold Ram Paste	Used as the backing layer of pots,or as the whole lining for small pots,or to fill the gaps between cathodes, the gaps between cathode and side blocks	25-50
PTLD Ⅱ-Ordinary Cold Ram Paste	Used to fill the seams blocks dovetail groves of cathode blocks	25-50
Note	BSZH、BSTH、BSGH、BSTN should be used together with semi-graphitic cathode blocks.	

Silicon Carbide block

SILICON NITRIDE BONDED SILICON CARBIDE BLOCKS

With high thermal strength and conductivity, excellent oxidation resistance, excellent Cryolite melt and liquid aluminum resistance, high resistivity and low thermal expansion, Si3N4 bonded SiC block has become the most ideal sidewall lining for aluminum reduction cell, which can increase the effective volume of reduction cell, raise the electric load, improve the output and prolong the service life of reduction cell.

We select high-quality SiC raw-material and silicon fine powder as starting materials, assisting with perfect grain size distribution and optimum nitrifying-sintered processes to produce Si3N4- SiC block, so this block features good appearance, accurate dimensions, homogenous micro-structure and excellent comprehensive performance, which has been used in thousands of aluminum reduction cells and tens of large-volume blast furnaces in the world.

--Properties of Si3N4-SiC Blocks

ITEM	CM-SiC75		CM-SiC72		CM-SiC78	
	Guaranteed date	Typical date	Guaranteed date	Typical date	Guaranteed date	Typical Date
SiC (%)	≥73.0	74.2	≥71.0	71.5	≥78	78.5
Si3N4 (%)	≥21	22.5	≥23	24.5	≥18	19.0
Fe2O3 (%)	≤0.5	0.3	≤0.5	0.4	≤0.5	0.4
Apparent porosity (%)	≤16	15	≤17	16	≤18	17
Bulk density (g/cc)	≥2.69	2.70	≥2.60	2.64	≥2.55	2.61
MOR(20℃,MPa)	≥50	55	≥40	48	≥45	52
HMOR(1400℃,MPa)	≥52	62	≥48	52	≥50	57
CCS (MPa)	≥150	180	≥140	180	≥120	160

--Properties of Sialon-SiC & Oxide--SiC Blocks

Item		Sialon Bonded	Oxide boned
SiC (%)	≥	70	85
SiO2 (%)	≥	/	8-12
Fe2O3 (%)	≤	1.5	1.5
Apparent porosity (%)	≤	18	17
Bulk density (g/cc)	≥	2.60	2.60
Bending Strength(20℃,MPa)	≥	35	-
Bending Strength (1400℃,MPa)	≥	40	-
CCS (MPa)	≥	150	100
Thermal shock(850℃,water cooling) times	≥	40	40
Load softening poit(0.2 Mpa, ℃)	≥	-	1600

Dense shaped refractroy products

The aluminium reduction cell and the bake oven usually use general or low creep fireclay refractory bricks as lining materials. The bricks should have good thermal shock resistance and better acidic-erosion resistance.

GENERAL FIRECLAY BRICK

ITEM	CM-N-3a	CM-N-3b	CM-N-4
Refractroiness / ^{0}C,≥	1670	1610	1710
Refractoriness under load 2Kg5/cm^3 /^{0}C,≥	1320	1300	1350
Reheating linear change (1350^{0}C*2h) /%	+0.2 -0.5	+0.2 -0.5	+0.2 -0.5
Apparent porosity /%	24	26	24
Cold crushing strength/Mpa,≥	25	20	25
Al_2O_3 /%,≥	35	30	40

LOW CREEP FIRECLAY BRICK

ITEM	CM-LR-1	CM-LR-2
Refractroiness / ^{0}C ,≥	1750	1730
Refractoriness under load 0.2Mpa, 1280^{0}C*25hrs /%,≤	0.5	0.5
Reheating linear change/%	+0.1~0.2(1450^{0}C,2h)	+0.1~0.2(1400^{0}C,2h)
Apparent porosity /%	≤19	≤19
Cold crushing strength /MPa,≥	≥50	≥50
Al_2O_3 /%,≥	42-53	38-48
Fe_2O_3 /%,≥	≤2.0	≤2.0

Light and heat protection brick

SILICON INSULATION BRICK

It is possessed of characteristics of high temperature strength, better refractory performance and higher refractoriness under load, high efficiency and energy-saving, prolonging the service life of kilns, etc..

It is widely applied as the heat insulating layer in the fields of glass, metallurgy, ceramics, chemical industry, etc..

--Properties of Silicon Insulation Brick

ITEM	CM-GGR-0.8	CM-GGR-1.0	CM-GGR-1.1	CM-GGR-1.15	CM-GGR-1.2
SiO2% ≥	88	91	91	91	91
0.1MPa refractoriness under load /^{0}C ≥	1400	1410	1450	1500	1550
cold crushing strength /MPa ≥	1.8	1.96	2.94	4.90	5.39
linear change after heating/% ≤	14500C×2h			15500C×2h	
	0.5	0.5	0.5	0.5	0.5
true density /g/cc ≤	0.8	1.0	1.1	1.15	1.2
thermal expansion(11000℃)/% ≤	1.3	1.3	1.3	1.3	1.3
Thermal conductivity /w/m.k average temperature 350℃±25℃	0.50	0.55	0.60	0.65	0.70

FIRECLAY INSULATION BRICK

The main raw material is hard-clay processed materials, the bond is the clay that is plasticity and excellent mineral fines of diatomaceous earth. The product is formed by engineering pressing and extrusion. It is used to the thermal coating and kiln hood lining that can prevent higher temperature fusil resources and corrosive gases. It contains steady chemical components, higher intensity, and better refractory effects. It is hard to find the refractory material.

It is used to the thermal coating and kiln hood lining that can prevent higher temperature fusil resources and corrosive gases.

--Properties of Fireclay Insulation Brick

ITEM	CM-NG -1.5	CM-NG -1.3	CM-NG -1.0	CM-NG -0.9	CM-NG -0.8	CM-NG -0.7	CM-NG -0.6	CM-NG -0.5	CM-NG -0.4
Volume density /g/cm3 ≤	1.5	1.3	1.0	0.9	0.8	0.7	0.6	0.5	0.4
compressive strength /MPa	5.88	4.41	2.94	2.45	2.45	1.98	1.47	1.18	0.98
Permanent Linear change ≤2%;the testing temperature of 8h heat preservation /℃	1400	1400	1350	1300	1250	1250	1200	1150	1150
Thermal conductivity / w/m • k	0.60	0.55	0.50	0.40	0.35	0.35	0.25	0.25	0.20

Light and heat protection brick

DIATOMITE INSULATION BRICK

It is producted by nature diatomaceous earth. The main features are higher apparent porosity, better insulating property, lower volume density, lower energy consume, smaller brick work thickness, lower project costs, improved work environment, higher productivity. It can use below 900°C. In addition, it is convenient to construct and lower price.

It is mostly applied heat preservation of pipeline transportation equipments of the gas and the liquid in electric power, metallurgy, engineering, chemical industry, petroleum industries etc. Also, it is used to the thermal protective coating of high temperature pyrology equipment within electric furnace, heating furnace, steel furnace, annealing furnace, and glass furnace etc.

--Properties of Diatomite Insulation Brick

ITEM	CM-GG -1.0	CM-GG -0.8	CM-GG -0.7a	CM-GG -0.7b	CM-GG -0.6	CM-GG -0.5a	CM-GG -0.5b	CM-GG -0.4
VolumeDensity /g/cc ≤	1.0	0.8	0.7	0.7	0.6	0.5	0.5	0.4
Compressive strength /Mpa ≥	5	4	2.5	1.18	0.78	0.78	0.59	0.59
Thermal conductivity /W/m.k	0.22	0.20	0.20	0.21	0.17	0.15	0.16	0.13
Permanent Linear change≤ 2%; heat preservation 8h testing temperature /℃	900							

HIGH STRENGTH INSULATION BRICK

The product is a kind of new outstanding and high efficiency adiabatic material, which is made of excellent diatomaceous bricks and other bond agents, specially for some especial needs of smelting furnace of nonferrous metals, treatment furnace and other pyrology equipments. It can save energy and extend service life of furnace as well.

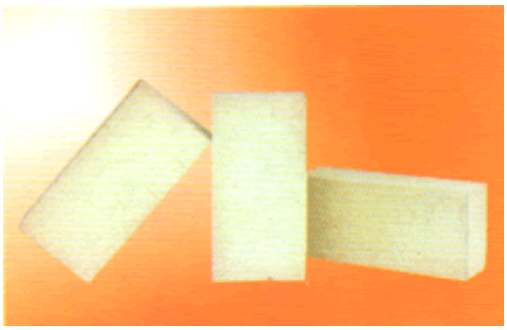
It is widely used as the lining and the heat insulation layer of industry kilns in the fields of metallurgy, petrochemistry, machinery, power, ceramics, etc.

--Properties of High Strength Insulation Brick

ITEM	CM-1	CM-2	CM-3	CM-4	CM-5
Bulk Density /g/cc ≤	0.7	0.7	0.5	0.5	0.6
Cold Crushing Strength /Mpa ≥	2.45	2.15	0.49	0.49	0.49
Thermal conductivity at350℃ /w/m.k ≤	0.20	0.21	0.15	0.16	0.17
Permanent Liner Change ≤2%;heat preservation 8h testing temperature /℃	900	1000	900	1000	1100

Light and heat protection brick

POLY-LIGHT HIGH-ALUMINA INSULATION BRICK

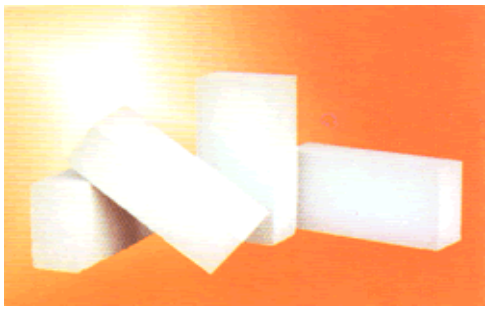


The fundamental raw material of this product is high–quality high-alumina bauxite. Polystyrene mirospheres lightening methode is adopted in the producing process. The products is high compression strength,good thermal shock stability,low heat conductivity,long-term stable performance in high temperature, etc..The product is widely used for various high-temperature kilns in the field of metallurgy,petrochemistry, machinery,power,building materials,etc.. It can be used as the lining or heat insulation layer because it can contact the fire directly. Till now, it is the most ideal heat insulation refractory materials that has good applicability in industry.

ITEM	CM-JLG-0.6	CM-JLG-0.8	CM-JLG-1.0	CM-JLG-1.2	CM-JLG-1.5
Bulk density /g/cm3 ≤	0.6	0.8	1.0	1.2	1.5
Cold crush strength /Mpa≥	3	3.5	4.5	5	7
Reheating linear change ≤2%/℃	1400	1400	1400	1400	1400
Thermal conductitivity /W/m.k, average temperature 350±10℃, ≤	0.2	0.25	0.33	0.35	0.35
Al2O3 /%≥	48	50	55	60	60
Fe2O3/%≤	1.8	1.8	1.8	1.8	1.8

POLY-LIGHT MULLITE INSULATION BRICK

The raw materials is crude high-quality high-alumina low ferrous content materials.The unique polylight spheres producing technique is adopted. The main structure of this brick is mulllite crystal phase. The characteristics of this product are high compression strength, good high tenperatrue performance, excellent thermal shock stability, low thermal conductivity,outstanding penetration resistance abiligy ,erosion resistance,etc.. It may be widely used as the lining and the heat insulation layer of industrial kilns in the fields of metallurgy,petrochemistry,machinery,power,ceramics,etc.. It is an ideal product of long service life,energy-saving and effects-enhancing product.



ITEM	CM-JMG-1400			CM-JMG-1500		
	0.8	1.0	1.2	0.8	1.0	1.2
Al2O3 /%≥	55			65		
Fe2O3/%≤	1.0			0.8		
Cold crush strength /Mpa≥	2.8	3.0	4.0	2.2	2.5	3.5
Thermal shock stability（time）（1100℃wind cooling）≥	15	20	25	15	20	25
Reheating linear change≤1%/℃	1400	1400	1400	1500	1500	1500
Thermal conductivity /W/m.k，≤(average temp.350±10℃)	0.25	0.3	0.35	0.25	0.3	0.35

Light and heat protection castable

DIATOMITE LIGHT CASTABLE

The castable material is the heat preservation blanket of kiln equipment, or the lining that touch directly flames. The main functions are heat preservation and heat insulation. It has characteristic of smaller volume density, higher cold crushing strength, lower permanent linear change, and lower thermal conductivity. It can improve integration and tightness of furnace body, thermal efficiency, and service life of kiln.It is diffusely utilized in heating power industry such as metallurgy, electric power, petroleum, chemical engineering and different boilers.

Item	CM-A	CM-B	CM-C
Secure application temperature ,	1000	1100	1200
Volume density, (g/cc)	0.5~0.6	0.6~0.7	0.7~0.8
Cold crush strength, (Mpa)	≥0.7	≥0.8	≥1.0
Bending strength , (Mpa) ,≤110℃	0.45~0.47	0.50~0.60	1.00~1.20
Permanent linear change reheating at 900℃ for 8hrs (%)	- 1.0~ - 0.8	- 1.0~ - 0.8	- 1.0~ - 0.8
Thermal Conductivity at350±25℃ ,(W/(m.k))	≤0.18	≤0.22	≤0.26

CLAY COMBINED REFRACTORY CASTABLE

Item	CM-NL-70	CM-NL-60	CM-NN-45
Al2O3 (%),≥	70	60	45
Refractoriness (℃), ≥	1760	1720	1700
liner change after heating≤±1%，testing temperature (3h heat preservation) (℃)	1450	1400	1350
compressive strength after drying (Mpa)	10	9	8
bending resistance after drying (Mpa)	2	1.5	1.0

Most parts of castable materials are used to the whole construction of castable in heating furnace and civil boiler, and the over wall and furnace arch in different industries kiln rolling steel heating that contains furnace, soaking furnace and annealing furnace, or tamping construction. Normally, the temperature is between 1350 ℃ and 1450℃.

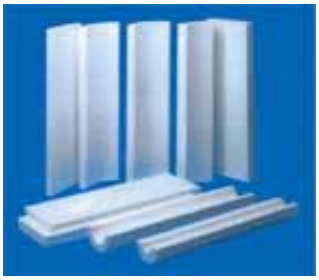
PREVENTING LEAKAGE CASTABLE

The preventing leakage castable for electrolysis cell is a kind of functionality material that is mainly used to prevent electrolyte leaking into the cell wall. That can extend the life time, reduce the cost of construction and debase the losing of heat dissipation. The castable is mainly used for the bottom of electrolysis cell, underside of cathode carbon and other industry furnaces.

Item		High-strength castbale		
Type		CM-FSJ-1	CM-FSJ-2	CM-FSJ-3
Content(Al2O3+ SiO2) (%); ≥		90	90	90
Bulk density (g/cc)		2.7	2.4	2.2
Bending strength(Mpa)	At 110°C for24hrs	8	5.5	5
	At 1000°C for3hrs	12	12	10
Cold crush strength(Mpa)	At 110°C for24hrs	50	30	30
	At 1000°C for3hrs	80	65	60
Permanent linear change after reheating at 1000°C for 3 hrs (%)		±0.3	±0.3	±0.4
Thermal conductivity at 350±25°C;(W/(m.k)) ≤		0.85	0.6	0.55

Heat Insulation board

NON-ASBESTOS CALCIUM SILICATE BOARD



High Intension：As the similar Bulk density，these products are one kind of abio-horniness insulation materials with the best strength.

▲Thermal resistance: In the range of service temp, these products have no heat transmutation

▲ Heat preservation & insulation：Thermal conductivity is lower than other horniness insulation products.

▲ These products have no asbestos Ⅰ

--Physical properties

Item	unit	CM-13	CM-17	CM-23	CM-30
Bulk density(max.)	kg/m^3	135	170	230	300
Flexural strength(min.)	Mpa	0.3	04	0.5	05
Compressive strength at5% deformation (min)	Mpa	0.5	0.8	0.9	0.9
Linear shrinkage(max.)	%	1.5			
Thermal conductivity(max.)（average temp.70℃）	W/m.k	0.049	0.056	0.056	0.062
Service temp.(max.)	℃	1050			

--Dimensions

Board	Length Width	Thickness	Tolerance
	600×300mm	25-115mm	+/-2mm

Note: We can provide with the products for customer's needs

--Application: The products are recommended as thermal insulation in stove,cave dwelling of steel mill, petrochemical, ceramics,glass,cement,metallurgy industries and power industries as well as other various ancillary heating equipment.

ALUMINIUM SILICATE FIBRE BOARD

Aluminium Silicate fibre products are processed by high quality calcined clay melted at electic furance via over 2000℃heating and spray to fibre, at the same time heated and solidified with equaly tailor-made adhesives and blowing to making fibre,they have low bulk density and thermal conductivity, good heat insulation, steady chemical capability, good insulation, good thermostability, widely used in thermoelectricity, chemical, metallurgy, electron, machine, etc industry , are used as heat preservation, heat insulation,fireproofing, moistureproof procucts.

--Properties of Aluminium Silicate fibre board

Chemical component		Al2O3	Al2O3+SiO2	Fe2O3	Na2O+K2O	
%		44	>96	<1.2	≤0.5	
Fibre Dia.	≤5%	Moisture		<0.5%	Moisture absorption rate	≤5%
Hydro-hate rate%	≥98	High temp.line shrinkage		≤4mm(1050℃×24P)	Thermal Conductivity W/m.k	0.04
Icombustibility	eligibility	Service temp./Refractoriness		≤1000℃/1790℃	Chlorin ion content (PPM)	10～30
Bulk Density, Kg/m3		80-100; 100-120; 120-150; 170-200				
Dimensions		Thickness: 10-100mm; length×width: 1000×500mm/600×400mm				

Silicon Carbide block

SILICON NITRIDE BONDED SILICON CARBIDE BLOCKS

With high thermal strength and conductivity, excellent oxidation resistance, excellent Cryolite melt and liquid aluminum resistance, high resistivity and low thermal expansion, Si3N4 bonded SiC block has become the most ideal sidewall lining for aluminum reduction cell, which can increase the effective volume of reduction cell, raise the electric load, improve the output and prolong the service life of reduction cell.

We select high-quality SiC raw-material and silicon fine powder as starting materials, assisting with perfect grain size distribution and optimum nitrifying-sintered processes to produce Si3N4- SiC block, so this block features good appearance, accurate dimensions, homogenous micro-structure and excellent comprehensive performance, which has been used in thousands of aluminum reduction cells and tens of large-volume blast furnaces in the world.

--Properties of Si3N4-SiC Blocks

ITEM	CM-SiC75		CM-SiC72		CM-SiC78	
	Guaranteed date	Typical date	Guaranteed date	Typical date	Guaranteed date	Typical Date
SiC (%)	≥73.0	74.2	≥71.0	71.5	≥78	78.5
Si3N4 (%)	≥21	22.5	≥23	24.5	≥18	19.0
Fe2O3 (%)	≤0.5	0.3	≤0.5	0.4	≤0.5	0.4
Apparent porosity (%)	≤16	15	≤17	16	≤18	17
Bulk density (g/cc)	≥2.69	2.70	≥2.60	2.64	≥2.55	2.61
MOR(20℃,MPa)	≥50	55	≥40	48	≥45	52
HMOR(1400℃,MPa)	≥52	62	≥48	52	≥50	57
CCS (MPa)	≥150	180	≥140	180	≥120	160

--Properties of Sialon-SiC & Oxide--SiC Blocks

Item		Sialon Bonded	Oxide boned
SiC (%)	≥	70	85
SiO2 (%)	≥	/	8-12
Fe2O3 (%)	≤	1.5	1.5
Apparent porosity (%)	≤	18	17
Bulk density (g/cc)	≥	2.60	2.60
Bending Strength(20℃,MPa)	≥	35	-
Bending Strength (1400℃,MPa)	≥	40	-
CCS (MPa)	≥	150	100
Thermal shock(850℃,water cooling) times	≥	40	40
Load softening poit(0.2 Mpa, ℃)	≥	-	1600

Dense shaped refractroy products

The aluminium reduction cell and the bake oven usually use general or low creep fireclay refractory bricks as lining materials. The bricks should have good thermal shock resistance and better acidic-erosion resistance.

GENERAL FIRECLAY BRICK

ITEM	CM-N-3a	CM-N-3b	CM-N-4
Refractroiness / ^{0}C,≥	1670	1610	1710
Refractoriness under load 2Kg5/cm^3 /^{0}C,≥	1320	1300	1350
Reheating linear change (1350^{0}C*2h) /%	+0.2 -0.5	+0.2 -0.5	+0.2 -0.5
Apparent porosity /%	24	26	24
Cold crushing strength/Mpa,≥	25	20	25
Al_2O_3 /%,≥	35	30	40

LOW CREEP FIRECLAY BRICK

ITEM	CM-LR-1	CM-LR-2
Refractroiness / ^{0}C ,≥	1750	1730
Refractoriness under load 0.2Mpa, 1280^{0}C*25hrs /%,≤	0.5	0.5
Reheating linear change/%	+0.1~0.2(1450^{0}C,2h)	+0.1~0.2(1400^{0}C,2h)
Apparent porosity /%	≤19	≤19
Cold crushing strength /MPa,≥	≥50	≥50
Al_2O_3 /%,≥	42-53	38-48
Fe_2O_3 /%,≥	≤2.0	≤2.0

Light and heat protection brick

SILICON INSULATION BRICK

It is possessed of characteristics of high temperature strength, better refractory performance and higher refractoriness under load, high efficiency and energy-saving, prolonging the service life of kilns, etc..

It is widely applied as the heat insulating layer in the fields of glass, metallurgy, ceramics, chemical industry, etc..

--Properties of Silicon Insulation Brick

ITEM	CM-GGR-0.8	CM-GGR-1.0	CM-GGR-1.1	CM-GGR-1.15	CM-GGR-1.2
SiO2% ≥	88	91	91	91	91
0.1MPa refractoriness under load /^{0}C ≥	1400	1410	1450	1500	1550
cold crushing strength /MPa ≥	1.8	1.96	2.94	4.90	5.39
linear change after heating/% ≤	14500C×2h			15500C×2h	
	0.5	0.5	0.5	0.5	0.5
true density /g/cc ≤	0.8	1.0	1.1	1.15	1.2
thermal expansion(11000℃)/% ≤	1.3	1.3	1.3	1.3	1.3
Thermal conductivity /w/m.k average temperature 350℃±25℃	0.50	0.55	0.60	0.65	0.70

FIRECLAY INSULATION BRICK

The main raw material is hard-clay processed materials, the bond is the clay that is plasticity and excellent mineral fines of diatomaceous earth. The product is formed by engineering pressing and extrusion. It is used to the thermal coating and kiln hood lining that can prevent higher temperature fusil resources and corrosive gases. It contains steady chemical components, higher intensity, and better refractory effects. It is hard to find the refractory material.

It is used to the thermal coating and kiln hood lining that can prevent higher temperature fusil resources and corrosive gases.

--Properties of Fireclay Insulation Brick

ITEM	CM-NG -1.5	CM-NG -1.3	CM-NG -1.0	CM-NG -0.9	CM-NG -0.8	CM-NG -0.7	CM-NG -0.6	CM-NG -0.5	CM-NG -0.4
Volume density /g/cm3 ≤	1.5	1.3	1.0	0.9	0.8	0.7	0.6	0.5	0.4
compressive strength /MPa	5.88	4.41	2.94	2.45	2.45	1.98	1.47	1.18	0.98
Permanent Linear change ≤2%;the testing temperature of 8h heat preservation /℃	1400	1400	1350	1300	1250	1250	1200	1150	1150
Thermal conductivity / w/m • k	0.60	0.55	0.50	0.40	0.35	0.35	0.25	0.25	0.20

Light and heat protection brick

DIATOMITE INSULATION BRICK

It is producted by nature diatomaceous earth. The main features are higher apparent porosity, better insulating property, lower volume density, lower energy consume, smaller brick work thickness, lower project costs, improved work environment, higher productivity. It can use below 900°C. In addition, it is convenient to construct and lower price.

It is mostly applied heat preservation of pipeline transportation equipments of the gas and the liquid in electric power, metallurgy, engineering, chemical industry, petroleum industries etc. Also, it is used to the thermal protective coating of high temperature pyrology equipment within electric furnace, heating furnace, steel furnace, annealing furnace, and glass furnace etc.

--Properties of Diatomite Insulation Brick

ITEM	CM-GG -1.0	CM-GG -0.8	CM-GG -0.7a	CM-GG -0.7b	CM-GG -0.6	CM-GG -0.5a	CM-GG -0.5b	CM-GG -0.4
VolumeDensity /g/cc ≤	1.0	0.8	0.7	0.7	0.6	0.5	0.5	0.4
Compressive strength /Mpa ≥	5	4	2.5	1.18	0.78	0.78	0.59	0.59
Thermal conductivity /W/m.k	0.22	0.20	0.20	0.21	0.17	0.15	0.16	0.13
Permanent Linear change≤ 2%; heat preservation 8h testing temperature /℃	900							

HIGH STRENGTH INSULATION BRICK

The product is a kind of new outstanding and high efficiency adiabatic material, which is made of excellent diatomaceous bricks and other bond agents, specially for some especial needs of smelting furnace of nonferrous metals, treatment furnace and other pyrology equipments. It can save energy and extend service life of furnace as well.

It is widely used as the lining and the heat insulation layer of industry kilns in the fields of metallurgy, petrochemistry, machinery, power, ceramics, etc.

--Properties of High Strength Insulation Brick

ITEM	CM-1	CM-2	CM-3	CM-4	CM-5
Bulk Density /g/cc ≤	0.7	0.7	0.5	0.5	0.6
Cold Crushing Strength /Mpa ≥	2.45	2.15	0.49	0.49	0.49
Thermal conductivity at350℃ /w/m.k ≤	0.20	0.21	0.15	0.16	0.17
Permanent Liner Change ≤2%;heat preservation 8h testing temperature /℃	900	1000	900	1000	1100

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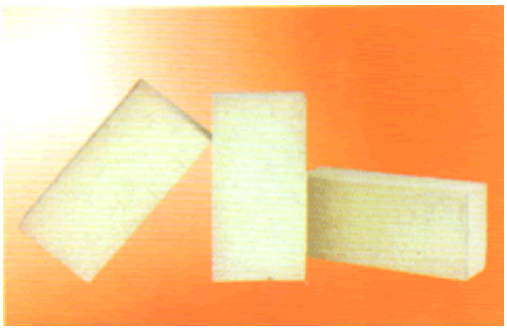

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Bulk density /g/cm3 ≤	0.6	0.8	1.0	1.2	1.5
Cold crush strength /Mpa≥	3	3.5	4.5	5	7
Reheating linear change ≤2%/℃	1400	1400	1400	1400	1400
Thermal conductitivity /W/m.k, average temperature 350±10℃, ≤	0.2	0.25	0.33	0.35	0.35
Al2O3 /%≥	48	50	55	60	60
Fe2O3/%≤	1.8	1.8	1.8	1.8	1.8

POLY-LIGHT MULLITE INSULATION BRICK

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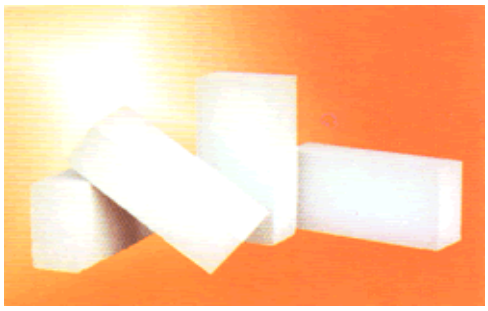

ITEM	CM-JMG-1400			CM-JMG-1500		
	0.8	1.0	1.2	0.8	1.0	1.2
Al2O3 /%≥	55			65		
Fe2O3/%≤	1.0			0.8		
Cold crush strength /Mpa≥	2.8	3.0	4.0	2.2	2.5	3.5
Thermal shock stability（time）（1100℃wind cooling）≥	15	20	25	15	20	25
Reheating linear change≤1%/℃	1400	1400	1400	1500	1500	1500
Thermal conductivity /W/m.k，≤(average temp.350±10℃)	0.25	0.3	0.35	0.25	0.3	0.35

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Item	CM-A	CM-B	CM-C
Secure application temperature ,	1000	1100	1200
Volume density, (g/cc)	0.5~0.6	0.6~0.7	0.7~0.8
Cold crush strength, (Mpa)	≥0.7	≥0.8	≥1.0
Bending strength , (Mpa) ,≤110℃	0.45~0.47	0.50~0.60	1.00~1.20
Permanent linear change reheating at 900℃ for 8hrs (%)	- 1.0~ - 0.8	- 1.0~ - 0.8	- 1.0~ - 0.8
Thermal Conductivity at350±25℃ ,(W/(m.k))	≤0.18	≤0.22	≤0.26

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Item	CM-NL-70	CM-NL-60	CM-NN-45
Al2O3 (%),≥	70	60	45
Refractoriness (℃), ≥	1760	1720	1700
liner change after heating≤±1%，testing temperature (3h heat preservation) (℃)	1450	1400	1350
compressive strength after drying (Mpa)	10	9	8
bending resistance after drying (Mpa)	2	1.5	1.0

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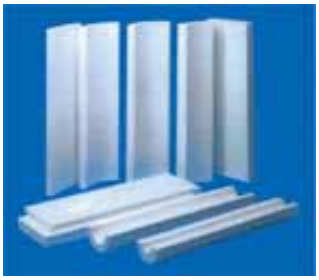
Item		High-strength castbale		
Type		CM-FSJ-1	CM-FSJ-2	CM-FSJ-3
Content(Al2O3+ SiO2) (%); ≥		90	90	90
Bulk density (g/cc)		2.7	2.4	2.2
Bending strength(Mpa)	At 110°C for24hrs	8	5.5	5
	At 1000°C for3hrs	12	12	10
Cold crush strength(Mpa)	At 110°C for24hrs	50	30	30
	At 1000°C for3hrs	80	65	60
Permanent linear change after reheating at 1000°C for 3 hrs (%)		±0.3	±0.3	±0.4
Thermal conductivity at 350±25°C;(W/(m.k)) ≤		0.85	0.6	0.55

Heat Insulation board

NON-ASBESTOS CALCIUM SILICATE BOARD



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▲ Heat preservation & insulation：Thermal conductivity is lower than other horniness insulation products.

▲ These products have no asbestos Ⅰ

--Physical properties

Item	unit	CM-13	CM-17	CM-23	CM-30
Bulk density(max.)	kg/m^3	135	170	230	300
Flexural strength(min.)	Mpa	0.3	04	0.5	05
Compressive strength at5% deformation (min)	Mpa	0.5	0.8	0.9	0.9
Linear shrinkage(max.)	%	1.5			
Thermal conductivity(max.)（average temp.70℃）	W/m.k	0.049	0.056	0.056	0.062
Service temp.(max.)	℃	1050			

--Dimensions

Board	Length Width	Thickness	Tolerance
	600×300mm	25-115mm	+/-2mm

Note: We can provide with the products for customer's needs

--Application: The products are recommended as thermal insulation in stove,cave dwelling of steel mill, petrochemical, ceramics,glass,cement,metallurgy industries and power industries as well as other various ancillary heating equipment.

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--Properties of Aluminium Silicate fibre board

Chemical component		Al2O3	Al2O3+SiO2	Fe2O3	Na2O+K2O	
%		44	>96	<1.2	≤0.5	
Fibre Dia.	≤5%	Moisture		<0.5%	Moisture absorption rate	≤5%
Hydro-hate rate%	≥98	High temp.line shrinkage		≤4mm(1050℃×24P)	Thermal Conductivity W/m.k	0.04
Icombustibility	eligibility	Service temp./Refractoriness		≤1000℃/1790℃	Chlorin ion content (PPM)	10～30
Bulk Density, Kg/m3		80-100; 100-120; 120-150; 170-200				
Dimensions		Thickness: 10-100mm; length×width: 1000×500mm/600×400mm				