

List of Carbon Refractory

1. Blast Furnace Lining Products

We, supply a full range of shaped products, such as block/bricks in carbon, graphite, alumina, silicon carbide and clay. We also manufacture a series of unshaped products, such as ramming mass, mortar and grouts. We have full line of standard products, however in many cases we custom manufacture our products to meet each customer's situation and requirements.

The following is a listing of our standard specification for several of our blast furnace products. Please contact us for further information on our full line of products.

(1) Super-micropore Baked Carbon Blocks

(Application Areas: blast furnace hearth and bottom)

Super-micropore Baked Carbon Blocks utilize high quality electric calcined anthracite as primary materials with multiple additives. They are molded under high pressure, baked at high temperature, and then machined to specifications.

Super-micropore Baked Carbon Blocks have good thermal conductivity, micropore structure and low permeability properties that can reduce the blast furnace erosion rate and efficiently prevent hot metal infiltration.

Properties	Typical Mean	Max	Min
Control Properties			
Bulk Density(Kg/m ³)	1700		1650
Apparent Porosity (%)	15	18	
Cold Crushing Strength (N/mm ²)	50		35
Supplementary Properties			
Permanent Linear Change (%)	0	0.2	-0.2
(After 5Hours at 1500°C)			
Modules of Rapture (MPa)	17		10
Ash Content (%)	20	22	
Thermal Conductivity(W/mk)	>18		18
600°C			
Pore Size Distribution	97		95
% of Pores finer than 5 pm			
Alkali Resistance	U		U
For Information			
Thermal Expansion at 1000°C(%)	3.5		

(2) Micropore Baked Carbon Blocks

(Application Areas: blast furnace hearth and bottom)

Micropore Baked Carbon Blocks use high temperature electric calcined anthracite coal and synthetic graphite as primary materials with various additives. They are molded under high pressure, baked at high temperature, and then finished by machining.

They have very high thermal conductivity and low permeability properties; they also have excellent resistance to hot metal erosion.

Properties	Typical Mean	Max	Min
Control Properties			
Bulk Density(Kg/m ³)	1650		1600
Apparent Porosity (%)	15	17	
Cold Crushing Strength (N/mm ²)	40		35
Supplementary Properties			
Permanent Linear Change (%)	0	0.2	-0.2
(After 5Houirs at 1500°C)			
Modules of Rapture (MPa)	13		10
Ash Content (%)	16		
Thermal Conductivity(W/mk)	>12		12
600°C			
Pore Size Distribution	90		80
% of Pores finer than 5 pm			
Alkali Resistance	U		U
For Information			
Thermal Expansion at 1000°C(%)	3.5		

(3) Graphite Blocks

(Application Areas: blast furnace bottoms, hearths next to the cooling plate and the areas of the copper cooling plate at middle and lower stack)

Graphite Blocks utilize low ash content, high quality petroleum coke and pitch coke as primary materials, along with high thermal conductivity additives. The bricks are molded under high pressure, impregnated and barked multiple times, graphitized and then machined to specification.

Graphite Blocks feature excellent thermal conductivity that leads to better cooling while efficiently reducing lining erosion and hot metal infiltration.

Properties	Typical Mean	Max	Min
Control Properties			
Bulk Density(Kg/m ³)	1650		1600
Apparent Porosity (%)	20	22	
Cold Crushing Strength (N/mm ²)	25		20
Supplementary Properties			

Permanent Linear Change (%)	0	0.2	-0.2
(After 5 Hours at 1500°C)			
Modules of Rapture (MPa)	10		8
Ash Content (%)	0.1	0.2	
Iron Content (%)	0.02	0.03	
Thermal Conductivity (W/mk)	120		100
200°C			
For Information			
Thermal Expansion at 1000°C (%)	3.5		

(4) High Heat Conductivity Carbon Blocks

(Application Areas: blast furnace hearth and bottom)

High heat conductivity carbon clocks utilize calcined, low ash content, and semi-graphitized anthracite as primary materials. In addition, they include fine powder additives and medium temperature pitch serving as binder. The blocks are molded and then baked at high temperature before final machining.

High heat conductivity carbon blocks have good thermal conductivity, good alkali resistance, and also good erosion resistance.

Properties	Unit	Guaranteed values
Carbon Content,min	%	94.0
Ash Content,max	%	5.0
Fe ₂ O ₃ content,max	%	0.30
Bulk density, min	Kg/m ³	1600
Apparent porosity, max	%	17.0
Cold crushing strength, min	N/mm ₂	32.0
Thermal conductivity(room temp).min	W/mk	22.0

(5) High Heat Conductivity Graphite Ramming Mass

(Application Areas: Gap Between shell/stave cooler and carbon lining, leveling layer)

High heat conductivity graphite ramming mass utilize electrical calcined, low ash content anthracite as aggregate, fine flake graphite as power. In addition, they include fine powder additives and mixed with resin. High heat conductivity graphite ramming mass has good thermal conductivity, it is a good filler to fill in the gap between carbon lining and stave cooler/ shell, leveling layer.

Properties	Unit	Guaranteed values
Bulk Density, min	g/cm ³	1.50
Compressive Strength (300°CX24h), min	MPa	10
Ash Content, max	%	8
Heat conductivity(600°C),min	W(m.k)	15
Adequate temp for erection	°C	0~50

(6) High corrosion Resistance Graphite Mortar

(Application Areas: Bricklaying carbon/graphite block/bricks)

High corrosion resistance graphite mortar utilizes low ash content graphitye powder as main raw materials, include fine powder additives and mixed with resin.

High corrosion resistance graphite mortar has good thermal conductivity, it is a good material for pasting the carbon and graphite blocks/ bricks while installation.

Properties	Unit	Guaranteed values
Carbon content,min	%	50
Ash Content, max	%	14
Volatile matter,max	%	35
Moisture, max	%	1
Seam extrusion test,max	Mm	1.0
Bind bending strength(300°C for 3hrs,after baking),min	N/mm ₂	4
Bulk density , min	g/cm ³	1.2
Application temp.		

2. Physical and chemical property,application and dimension tolerance of cathode product for alumina electrolysis

Cathode products we manufactured adopts high quality electrically calcined coal, graphite grain and medium temperature coal pitch as raw material, mill electrically calcined coal and graphite grain to different sizes grain, use coal pitch as binder, mix dry material together to get the cathode paste, put cathode paste in a fixed size of mould for molding, bake the molded paste for hundreds of hours, machine the baked raw products to get dovetail grooves, clean appearance.

(1) Graphite ferrous cathode carbon (Bottom of alumina electrolysis cell)

Brand	True Density (g/cm ³)	Apparent Density (g/cm ³)	Resistivity (room temperature) (Ω.m)	Compressive strength (MPa)	Ash Content (%)
	≥	≥	≤	≥	≤
GS-1	1.91	1.56	39	32	8
GS-3	1.95	1.57	35	24	5
GS-5	1.99	1.57	30	24	4

GS-10	2.08	1.59	21	26	2
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Designation	Dimension tolerance				
	Width/mm	Height / mm	Length/mm	Steel rod tank width,depth/mm	Squareness
Machined bottom carbon block	±3	±4	±12	±3	±0.4

(2) Graphite ferrous cathode carbon (Bottom of alumina electrolysis cell)

Brand	True Density (g/cm ³)	Apparent Density (g/cm ³)	Compressive strength (MPa)	Ash Content (%)
	≥	≥	≥	≤
GS-C	1.91	1.56	32	8

Designation		Dimension tolerance			
		Width/mm	Height /mm	Length/mm	Squareness (°)
Machined side carbon block	Carbon block not at corner	±3	±3	±5	±0.4
	Corner carbon block	±5	±5	±5	-

(3) Specification of graphite ferrous cathode carbon block (mm)

400X400X1300	400X400X1500	400X400X1600	400X400X1800	400X400X2100
400X400X2800	400X400X3100	515X450X3100	515X450X3250	515X450X3350
550X420X3100	550X420X3200	550X420X3400	550X420X3650	