2007 Annual Report on Chinese Silicon Carbide Market

1. Introduction

1.1 Classifications

Silicon carbide is also called carborundum, including black and green silicon carbide both with a shape of hex crystal. The black silicon carbide is classified into coke-made and coal-made black silicon carbide according to raw materials. The former one is made from quartzite and petroleum coke and the latter is made from quartzite and blind-coal, and both were smelted in high-temperature resistance furnace. The material is extremely hard and sharp, with excellent chemical properties. The hardness is between diamond and fused alumina, but the mechanism hardness is higher than fused alumina. The micro hardness is in the range of 2840-3320kg/mm^2.

1.2 Property

Silicon carbide is sharp but fragile with good heat-resistance, heat-conductibility, can be antacid and antalkali, lower dilatability, and can be aseismatic.

1.3 Main application

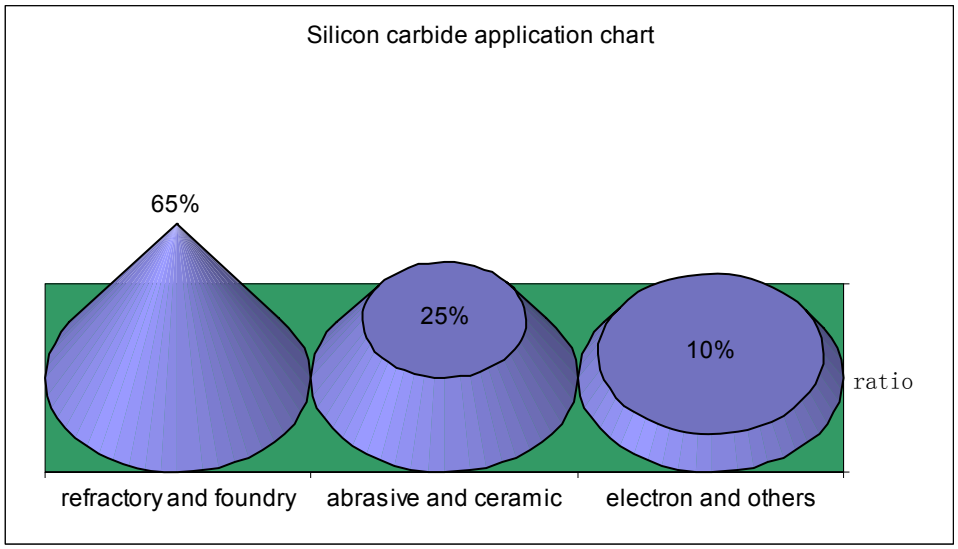
Nonferrous metal industrial

With the advantage of heat-resistance, heat-conductibility, anti dilatability, the materials can be applied as calefaction, silicon carbide can be applied as distil furnaces, rectify stove tray, alumina electrobath, inner liner of smelted furnace of copper, arc plate of Zinc powder, thermocouple protection pipe etc.

Steel Industry

It is manufactured into inner-liner of large scale blast furnace to expand the longevity by the advantage of its antacid, heat-conductibility, aseismatic.
Mill running Industry for metallurgy With a good hardness, silicon carbide is the first choice raw material for manufacturing abrasive pipe, impeller, pumping chamber, and trolley liner etc. Its abrasiveness is 5-20 times than that of cast iron and rubber. It is also perfect raw material for runway of plane. Ceramic industry

The silicon carbide is excellent in heat conduction, heat radiation, and it is suitable to make kiln tools to enlarge the capacity of kilns and improve quality of products. It is widely applied as the indirect material for drying ceramic glaze. The green silicon carbide products were applied to cut solar battery.



2. Distribution

2.1 The distribution around the world

2.1.1 America

Electro Abrasive Company

Electro is a silicon carbide processing factory with a capacity of 24,000tpy. It produces black and green silicon carbide micro-powder with water filtration in New York. The main contents of its products are 98%min grain sands and fines, which is widely used in abrasive, refractory and other industry.

Superior Graphite Company

It is a smelter for β-sic production plant in Hopkinsville, in Kentucky states of America. Its main products are micro-powder or fines for ceramic production.

BPI Company Limited

BPI Company has four silicon carbide recyclers in the United States, which source scraps from North America and uses the recycled scraps as raw material and sell the finished products in metallurgy market.

Elmet Company

It is located in north of Mexico, with a capacity of 20,000tpy. The smelter mainly produces metallurgical-grade silicon carbide (88%min) and black silicon carbide (97%min), which are used in steel, foundry, abrasive and refractory industry. It invests about USD3M in purchasing some facility in order to decrease production cost and promote products quality.Elmet Cor., Ltd

The smelter mainly sells silicon carbide in Mexico domestic market, and exports small percentage of its products to Middle America and North Europe.

Brazil

Saint Gobain is the largest silicon carbide producer in America, with a capacity of 60,000tpy.

2.1.2 Europe

ESK-SIC Company

ESK-SIC, the second largest silicon carbide smelter around the world produces about 65,000tpy metallurgy-grade silicon carbide and silicon carbide crude block, and makes deep procession in Frechen-Grefrath plant in Germany. It accounts for about 10 percent of the market share in the world, with its products being used in metallurgical, abrasive, refractory and superior ceramic industry.

Navarro SIC Company

The company mainly produces silicon carbide fines, which is mainly applied in abrasive and refractory industry. The main products are metallurgical-grade silicon carbide (SIC:90%min or 92%min), refractory-grade silicon carbide (SIC:92%min, 95%min and 98%min) and abrasive-grade silicon carbide (SIC:97%min and 99%min). Among them, metallurgical-grade silicon carbide takes up about 45 percent, the biggest market share. The secondary and the last one are refractory-grade silicon carbide with about 30 percent market share and abrasive-grade silicon carbide for 25.

Now, Navarro has expanded its green and black silicon carbide micro-powder production, with an 800-1,000tpy-production capacity.

Since 2000, Navarro has been increasing its sales both in domestic and European market, but decreasing in Asia, Africa and Oceania. The sales in metallurgical and refractory industry are on the rise, but falling in abrasive industry.

ZAC Company

ZAC Company is a well-known abrasive-grade silicon carbide smelter, with a capacity of 30,000tpy, whose products are mainly used in metallurgy, abrasive refractory and micro-powder industry. It mainly exports to Czechoslovakia, and West Europe.

It has its plants in Russia, Romania, Czechoslovakia and Swiss in Europe.

2.1.3 Asia

Japan

Japan ranks the second largest silicon carbide producer in Asia. The first two major smelters are Yakushima Denko and Pacific Rundum plants, with capacity of 20,000tpy and 7,000tpy respectively. Pacific Rundum sells its products in semi-conductor, abrasive and refractory industry.

2.2 Chinese silicon carbide production

China is the largest producer and exporter for silicon carbide around the world, with a capacity of 600,000tpy, among of which 40 percent above exports. The United States and Japan are the two largest target markets; and South Korea, Mexico comes to the heel.

Silicon carbide smelters mainly centralize in Norwest China, such as Ningxia, Gansu, Qinghai, Sichuan and Xinjiang province, where power supply is sufficient and power prices are relative low. It consumes about 6,000-7,000kwh power for one ton of silicon carbide production, which accounts for above 50 percent of its production cost, while the green silicon carbide market consumes about 8,000kwh per one ton. Silicon carbide grain sands and powder processors are mainly in Henan, Shandong, Jiangsu and Liaoning.

Ningxia is the largest silicon carbide production base with a total capacity of 150,000-180,000tpy. Several major famous smelters such as Ningxia Tianneng Tianhao, Xindi Power, etc., are all located in Ningxia.

Ningxia Tianneng Tianhao operates one 8,000kva and three 12,500kva furnaces, with a 40,000tpy production capacity for crude block, and also has several production lines for grain-making and sands-making.

Ningxia Xindi Power is the second largest silicon carbide smelter in Ningxia. It runs one 4,600kva, two 8,600kva and one 12,500kva furnace, with a 30,000tpy production capacity. The smelter installed sands and grain-making production lines late 2005.

Gansu has a production capacity of 120,000-150,000t for silicon carbide. The largest silicon carbide smelter all over the world—Lanzhou Heqiao Resources Co.Ltd located in Gansu, with a combined capacity of 100,000tpy for coal-made and coke made silicon carbide.

Qinghai province is the main production base of green silicon carbide, and the production capacity is in the range of 80,000-100,000tpy. By the advantage of power supply, smelters are usually with a power of above 10,000kva and high crystal density.

Qinghai Guiqiang ranks the largest green silicon carbide producer in the world, with a capacity of 60,000tpy of green silicon carbide crude blocks. The smelter has its grain sands and powder production line located in Lianyungang. In 2007, the smelter cooperated with Chinese largest green silicon carbide powder producer Pingdingshan Yicheng Co., Ltd, which realized a good cooperation between the two giants.

The capacity of black silicon carbide is in the range of 80,000-100,000tpy in Qinghai. Qinghai Fangsheng Abrasive is the largest smelter for silicon carbide production, which operates one 12,500kva, one 6,300kva and one 3,150kva furnace with a capacity of 25,000tpy.

Xingjiang is a production base of coke-made silicon carbide. There are several major newly established projects for the production of green silicon carbide in 2007, which makes a good preparation for 2008. The present capacity of green silicon carbide is around 60,000t. Yineng high-tech Co., Ltd is a main producer who specializes in producing coke-made silicon carbide crude blocks, making use of the patent from Xian Science and Technology University. Its capacity keeps at 20,000tpy.

Silicon carbide capacity is in the range of 50,000-60,000tpy in Sichuan, including green and black coke-made silicon carbide. Affected by the dry season, the power supply can only satisfy to produce for 6-7 months. And the furnaces are usually less than 10,000kva.

3. Market analysis and retrospect

The market keeps rising in 2007 on the whole, pushed up by the robust demand from overseas and Chinese markets and the increasing power price and raw materials. Smelters kept a zero stock generally.

After the Chinese Spring Festival, black silicon carbide prices kept rising step by step. Though the smelters run fully at their capacity, they still couldn't meet the demand. Limited by the export quota, the export prices for grade-two silicon carbide increased again and again. With the rumor of power price increase, smelters raised price in advance in the first quarter, while after the power price was raised, the price for grade-two climbed to RMB3,450/t delivered to Tianjin port. The demand kept strong after the price increase, and the smelters had no stocks and buyers needed to make payment in advance universally. The impetus of price increase in the fourth quarter is from the tight supply of raw material-blind coal. Because many small coalmines were shut down, the supply became tighter and the price rose in turn, from RMB500/t to RMB600/t ex works. Meanwhile, supported by the high price of export license, grade-two silicon carbide price for export rose from USD450-470/t before May 1st to USD570-580/t FOB, and the price were pushed to USD640/t FOB for the last contracts in December.

Green silicon carbide market kept stable in the first half year, with a slight increase, but the situation became quite different from August, disturbed by the roaring price of petroleum coke, which in turn is driven by the price of international crude oil. From the green silicon carbide crude blocks to grain sands and powder are kept hiking in the second half year. Smelters even raise their prices 4 times during a month. The price of crude blocks rose from RMB7,200-7,300/t delivered to Zhengzhou to RMB9,800/t at the late December. The market turns to be stable followed by the stabilizing of international crude oil by early December. Along with the roaring price, the demand for green silicon carbide grain sands and powder kept strong and most smelters had no materials in stocks.

3.1 Main factors for silicon carbide market in 2007：

3.1.1 Power price

Under the influence of national policy on high-power consumption products, power prices doubled in 2007, as fallout, power price rose to about RMB0.38/kwh in Qinghai, RMB0.35/kwh in Gansu and RMB0.40/kwh in Ningxia by the end of 2007.

In view of such high power cost and supported by the robust market demand, most smelters raised silicon carbide several times with the price being increased to RMB3,500-3,550/t delivered to Tianjin port for 0-10mm 88%min or 90%min silicon carbide in December of 2007 from RMB2,800/t early 2007. Simultaneously, 97%min silicon carbide crude block price also jumped to RMB4,600-4,700/t ex works from RMB4,100-4,200/t delivered in late 2006..

3.1.2 Raw material price

In the first half year of 2007, both the prices of blind coal and petroleum coke kept stable with a stable supply. But there was a sudden turn when it came to July and August. The tight supply of blind coal caused by the shut down of private coal mines supported the continuous price increase in the second half year of 2007. Meanwhile, affected subtly by the price of international crude oil, Chinese petroleum coke price kept roaring from August to late November. Some raw materials suppliers even adjusted the price up by four times with one month. The market price of petroleum coke rose from RMB1,500-1,600/t in August to RMB2,600/t ex works in Late November, with a 68% markup.

3.1.3 Market demand

Silicon carbide is mainly applied in two major markets—refractory and abrasive markets.
Chinese domestic market: Supported by Chinese robust steel market, the refractory market kept a strong demand for grade-one and grade-two silicon carbide, especially in the fourth quarter, the alumina market showed a very strong demand for grade-one grits sands.

International demand: American, Japan, Korea, Mexico, China Taiwan and Indian ranked the top six countries and regions. They imported nearly the same volume of silicon carbide from China, and the total volume is 225,260t.

The abrasive market kept strong all through 2007, which is a very important impetus to drive up the prices of silicon carbide. It took 20-30% of the total demand. Another difference for silicon carbide market is the strong demand for green silicon carbide grain sands and powder.

3.1.4 Price of export license

In 2007, the original price of export license is RMB246/t, with 235,000t of export quotas. However, the international demand for silicon carbide is far more than this quantity. Therefore, the price of export licenses was pushed up by the numbered export quotas. The price rose from RMB246/t at the beginning of 2007 to RMB750/t in May and June. At the basis price in last year, the second round of export license price climbed again in July 2007, and it has jumped to RMB1,100/t at the end of 2007. The momentum comes from strong demand from international market.

3.1.5 Exchange rate of Renminbi

Exchange rate is not primary factor to affect the price of silicon carbide, but the continuous appreciation of Renminbi cannot be ignored. The exchange rate of Renminbi vs US dollar was rising from 7.78:1 at the beginning of January to 7.50: 1 in July and to 7.23:1 at late of the December 2007.

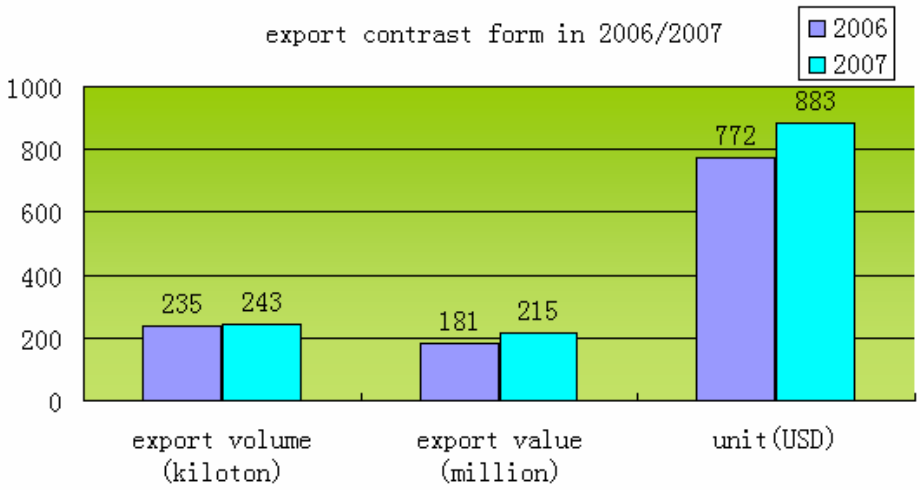
3.2 Silicon carbide market analysis

Affected by the synthetical impaction of power price, raw material price, market demand and climbing price of export license, the silicon carbide market showed a strong uptrend in 2007. The detailed as follows:

3.2.1 Export market：

3.2.1.1 Export quantity

China exports 243,000t silicon carbide in 2007, up by 30% from 235,000t year-on-year. The export value increases to RMB215M, increased by 18.8% compared to RMB181M in 2006. Export prices averages at USD883/t, up by 14.4% from USD772/t in 2006.
The details seen as in the following diagram：



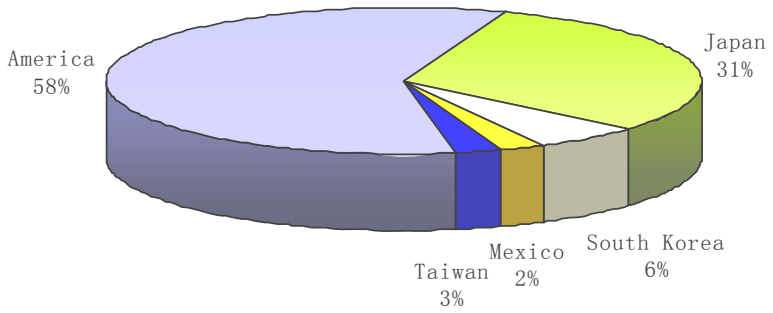
3.2.1.2 Export countries and regions

Chinese silicon carbide was exported to 49 countries and regions in 2007. China exported 128,400t to America, 67,600t to Japan, 12,700t to South Korea, 5,470t to Mexico and 5,760t to Taiwan. And Indian market is the sixth country following the above fives ones with a export volume of 5,330t. The total quantity to the six countries takes up 92% of the total volume of 243,000t.

Contrast table for export countries and regions 2006/2007

country	2006 volume （Kiloton）	2007 volume （kiloton）	Up/down volume （%）	2006 value (Millon）	2007value(Million）	Up/down value （%）
America	13.14	12.84	-2%	64.48	74.93	16%
Japan	6.09	6.76	11%	79.91	95.70	20%
South Korea	1.17	1.27	8%	8.77	10.10	15%
Mexico	0.62	0.547	-11%	3.27	3.31	1.2%
Taiwan	0.58	0.576	0.69%	7.96	8.74	9.8%

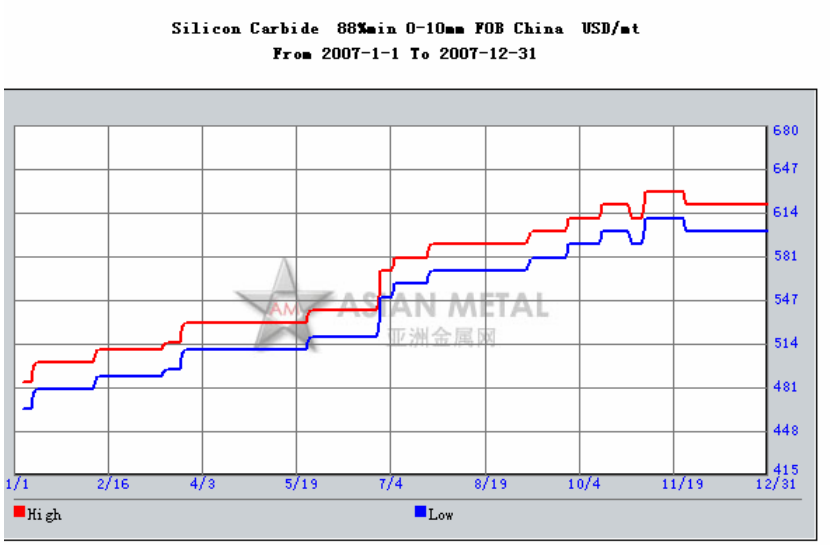
Major silicon carbide importers in 2007



3.2.1.3 Export price:

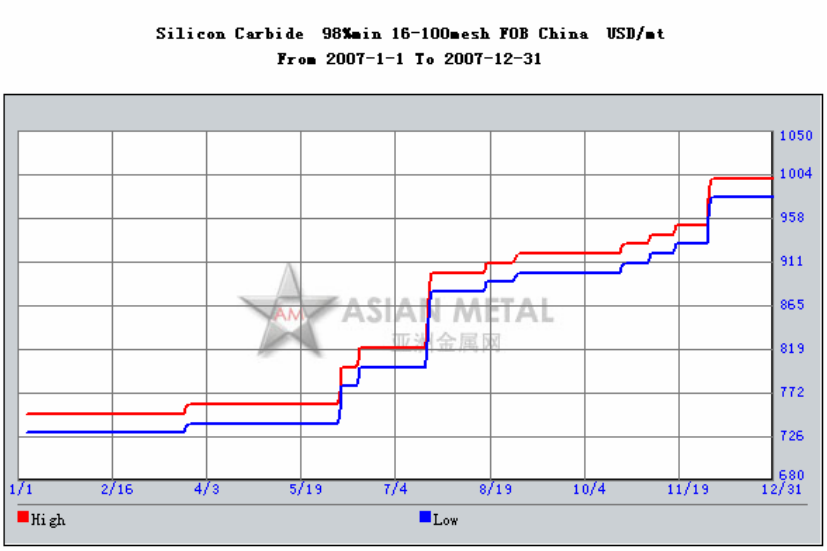
Grade-two silicon carbide export market:

At the beginning of 2007, the price of 88%min or 90%min 0-10mm sands was in the range of USD450-470/t FOB Tianjin port, and it climbed to USD510-530/t FOB in early of March pushed up by the high price of export license. In the middle of the year, the price was in the range of USD570-580/t FOB Tainjin port, with the export price in the range of RMB750/t ex works and also driven by the power price increase in May. There was a sudden increase in the last two months of the year, for blind coal price increased by about RMB100/t which brought about RMB150/t to the silicon carbide cost. Meanwhile, very few export licenses left and the price reached as high as RMB1,000/t in October. Therefore, the price of grade-two silicon carbide 0-10mm sands jumped to the climax in 2007. But with the approach of New Year, the market became slow and the price dipped a little from USD640/t FOB in Novermber to USD610-620/t FOB in December. Following is the curve for grade-two silicon carbide 0-10mm sands export price:



The export market for grade-one silicon carbide also kept rising on the whole, supported by all the factors mentioned above. At the beginning of 2007, the mainstream price for grain sands 100mesh-0 sands was in the range of USD730-750/t FOB. After the power price was adjusted up in May, the export price was raised to USD800/t FOB. However, the depression of US dollar made Chinese currency kept appreciation with a sharp speed in the second half year of 2007, which caused the export price for grade-one grain sands rise to USD9,80-1,000/t FOB in the last two months of 2007.

The following is the export price of silicon carbide grain sands 16-100mesh 98%min：

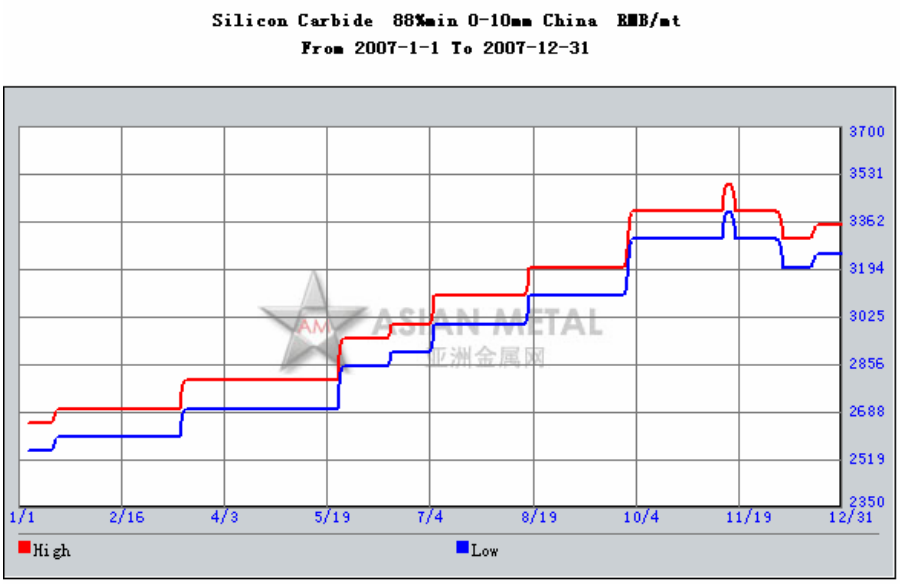


3.2.2 Domestic market:

3.2.2.1 Grade-two silicon carbide market:

About 70-80% of grade-two silicon carbide would be sold to overseas market, so the domestic market was impacted by export market significantly. The grade-two silicon carbide market showed an up trend generally in 2007. The details are as follows:

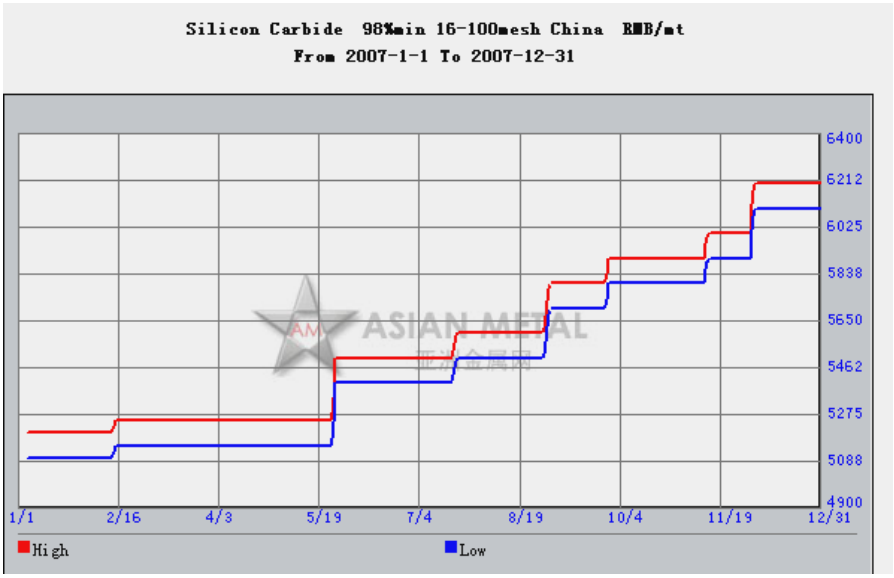
Influenced by raw material price and strong demand, the grade-two silicon carbide market kept firming up although the year. The price for silicon carbide sands 0-10mm 88%min 0r 90%min rose from RMB2,850/t ex works to RMB3,200/t in June and RMB3,300-3,400/t ex works at the end of 2007. Same as the export market, in the last two months, the demand for grade-two was sluggish in December; smelters even had thousands of materials in stocks. Therefore the price dropped and stabilized at RMB3,150-3,250/t ex works for more than one months.



3.2.2.2 Grade-one silicon carbide market:

The silicon carbide 98%min is not only applied as important abrasive raw material, but is also applied as metallurgical raw materials. The demand for the material was strong in 2007. In the first half year, the price of acid washed silicon carbide grain sands 100mesh-0 98% stabilized in the range of RMB5,100-5,200/t ex works, but it rose to RMB6,100-6,200/t in July and along with the price of crude blocks, it was around RMB6,400/t ex works. Meanwhile, the dry grain sands 100mesh-0 98%min increased from RMB4,600/t ex works in January to RMB5,500-5,600/t ex works in December.

Set silicon carbide crude blocks 97%min as another example: In the first five months in 2007, the price kept stable more or less in the range of RMB4,000-4,100/t ex works. Things became different after the power price was raised in May. The price rose by RMB300/t to RMB4,200-4,400/t ex works, but the smelters got thin profits from the materials because the high cost on the power price and raw materials. During August to October, the price was stable at RMB4,400/t ex works and it came to RMB4,600/t ex works.



4. Outlook for silicon carbide market

4.1 Export market:

Seen from the situation of global economy, the depression of American economy caused by the sub-loan crisis would continue in 2008. According to some economists' analysis, in 2008, American economy would slow the increase markup, and the depression of US dollar will not be reversed in a short term. On one hand, the continuous depression of US dollar is causing other countries' foreign exchange to be shrunk, and other countries' domestic economy keeps inflation on other hand. As a result, the markup of silicon carbide for export would be sped up in the following year.

The total export quotas in 2008 is 236,00t , but it can't meet the demand from international market for the materials, which will in turn push the export license high and would be in the range of RMB1,000-1,500/t ex works in consideration of the foreign buyers acceptance.

4.2 Domestic market

Seen from the market demand, silicon carbide is mainly consumed by the metallurgical plants, including the steel mills and alumina and other metals mills. Affected by the tightening financial policy, the demand from downstream markets such as construction, mechanics, motorcar, container and shipbuilding would slow because the investment would be reduced in view of the high lending rate. As a result of the above reason, the

robust situation of steel mills would reverse in the second half year of 2008. Meanwhile, Chinese government is carrying out the policy of saving energy and reducing to discharge pollutants, some small steel mills would be shutdown. The demand for the refractory materials would be reduced consequently. The demand for green silicon carbide keeps strong in Chinese market, and many newly founded smelters would begin to produce in 2008.

But seen from power and raw materials prices, the production cost would certainly rise in 2008. With the tight supply of coal, coal price have been keeping rocketing since the last December. Power supply enterprises would adjust up the price in the following months, and some enterprises have improved their prices around February 2008. The price of raw materials showed a strong up trend after the Spring Festival. Industry insiders predict the raw material price to keep on rising in the first half year, and it may turn to stable after the Olympics. In addition, petroleum coke price would be affected by the rocketing price of international crude oil price caused by the sharply of depression of US dollar.

On the whole, silicon carbide market in Chinese market would remain strong, and prices would go in the upward trend. The demand for refractory materials may weaken compared to 2007. The price would surely rise along with cost on power and raw materials. However, the profits would be thinner for both smelters and processors. But the demand for green silicon carbide keeps strong in Chinese market, and many newly founded smelters would begin to produce in 2008.