
2008 Annual Report on Magnesite Market

1. Brief introduction

1.1 Caustic burned magnesite

The caustic calcined magnesite is made from calcined magnesite powder through Mixing, pressing period. It is used for converter through the splashing cross to protect the furnace and prolong the life span of furnace in steel mills. Meanwhile, the caustic calcined magnesite is widely used in chemical, construction, environmental, agricultural and industries applications.

1.2 Dead burned magnesite

Dead burned magnesite includes regular-grade burned magnesite, mid-grade burned magnesite and high-purity burned magnesite.

1.2.1 Regular-grade dead burned magnesite

The mid-grade burned magnesite is made from magnesite calcined in the shaft kiln. They are widely used to produce unshaped refractory, which can be used as the underlay of open-hearth furnace and electric furnace.

1.2.2 Mid-grade burned magnesite

The mid-grade magnesite is made from the caustic burned magnesite 95-97% which were pressed and calcined in shaft kiln. The materials can be used as the raw material of magnesite products. The mid-grade burned magnesite is classified into coal-burned and oil-burned mid-grade magnesite, depending on different fuel.

1.2.3 High-purity magnesite

The raw material of high-purity magnesite is selected from super-grade magnesite, and it is made through the processes of the flotation, purity, fine-grinding, briquette and high temperature calcined in oil shaft kilns. It is the excellent raw material to produce magnesite bricks and unshaped refractory material. MgO: 97.5-98%、B.D≥3.30g/cm³、C/S>2.

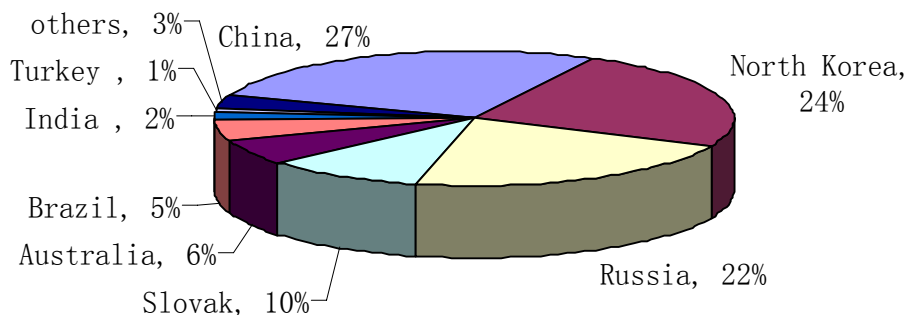
1.3 Fused magnesite

The material of fused magnesite sinter is selected from special grade-A magnesite or high-purity caustic calcined magnesite, which is fused in arc furnace. The fused magnesite is excellent for its high purity, big crystalline grain and compact texture and high heat-vibration steady and cinder corrosion resistant. It is used to make high quality

magnesite bricks, magnesia-carbon bricks and unshaped refractory materials.

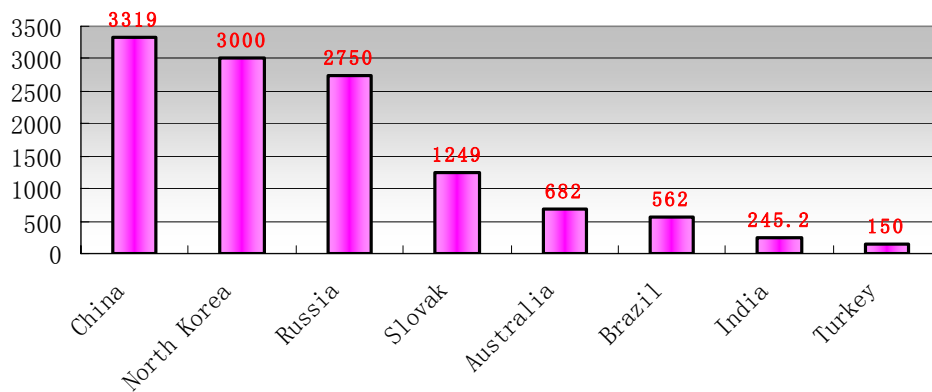
2. Distribution of magnesia in the world

The production distributions of magnesia are closely related with the regions of the reserves of magnesite ores. There are about 12.6 billion tons of magnesite in total in the world according to the data from *Industrial Minerals*, and 98% of magnesite ores are distributed in nine countries. The detail distribution is illustrated by the following diagram:



In all of the magnesite reserves, the crystal magnesite accounts for 92%, distributing in China, North Korea, Russia and Slovak and the latent crystal magnesite accounts for 8%.

top 8 countries of magnesite reserves (MT)



country	volume(mt)	crystal magnesite	latent crystal magnesite
China	3319	3248	71
North Korea	3000	3000	
Russia	2750	2745	5
Slovak	1240	1240	
Australia	682	132.2	549.7
Brazil	562	562	
India	245.2	186	59.2
Turkey	150	150	

3. Production of magnesia

3.1 Major production regions in the world

The total capacity of magnesia in 2008 is estimated in the range of 800-820million ton. Though Chinese government put export quota and export tariff on magnesia 70%min, China is still the biggest supplier of magnesia in the world market. However, as important refractory materials in metallurgical industries, many countries are trying their best to explore their own reserves of magnesite in order to meet the demand and to lessen the dependence to Chinese magnesia. The following is the production of magnesia all over the world.

America: In South America, after being purchased by a private equity firm in 2007, Brazil's leading magnesite producer announced plans to triple its dead-burned magnesia production and double its refractories production. Based on first quarter 2008 production data, the company would increase dead-burned magnesia production to 360,000 tons per year, a small increase from the plant's current production capacity of 320,000 tons per year. However, the company planned to increase its refractories production capacity to 580,000 tons per year by 2009 from its current level of 335,000 tons per year. Most of the company's refractory products are used by Brazil's steel industry. The company also acquired a German refractories company in September 2008; the combination of the two refractories groups would create the world's third ranked refractories company in terms of revenue.

In North America, the Martin Marietta LLC is the manufacturer of dead burned magnesia. In recent years, the company switched to caustic-calcined magnesia. In 2007, the company finished the plant in Michigan producing $Mg(OH)_2$ powder with the increase rate of 25,000t per year. To meet the demand of fire retardant, the company enlarges its capacity aiming to produce fire retardant with low poison, little smoke and no halogen. Currently, the annual capacity of caustic-calcined magnesia and $Mg(OH)_2$ is 275,000t. The Muscle Shoals Mining Co. which lies in Alabama produces 14,000t of electronic-fused magnesia and refractory-fused magnesia.

The Premier Chemical Co., Ltd produces 140,000t of caustic-calcined magnesia and $Mg(OH)_2$. The company also enlarge its capacity of magnesia products, mainly were used as fire retardant and flame retardant.

In Mexico, Quimica del Rey belonging to Industrias Penolas produces magnesium sulfate, caustic-calcined magnesia, dead burned magnesia and fused magnesia by halogen water and dolomite ore from Laguna del Rey and La Esmeralda. Industrias Penolas invested \$15,000,000 to establish fire retardant, with designed capacity of 15,000tpy. The company has come on stream in early 2008. Industrias Penolas will enlarge the capacity of magnesia from 84,000tpy to 110,000tpy in 2009. In 2006, the company began to produce electro-fused magnesia, and now it is one of the two suppliers of electro-fused magnesia in Europe.

In Canada, the magnesite producer announced that it would double the production capacity for caustic-calcined magnesia at its Exshaw, Alberta, plant to 50,000 tons per year by adding another furnace and was considering restarting production at its 14,000-ton-per-year fused magnesia plant.

Asia and Pacific areas:

Except China, Australia is the main production area of magnesia because of the great reserves of magnesite.

Causmag Ore Co., which locates in New South Wales, is a producer of caustic calcined magnesia. In May of 2008, the production was stopped due to the suspension of gas supply and continued to produce from July. The annual capacity of caustic-calcined magnesia is 18000t.

Production capacity at the caustic-calcined magnesia plant in Queensland, Australia, was set to increase by 100,000 tons per year from its current capacity of 80,000 tons per year in response to growth in the world steel, nickel, cobalt, copper, and agricultural markets. Installation of a third multiple-hearth furnace was scheduled to be completed by September 2009. The company also has the capacity to produce 110,000 tons per year of dead-burned magnesia and 30,000 tons per year of fused magnesia.

DSP is a magnesia producer of Israel Chemical Co. The company extract magnesia, Mg(OH)₂ and Magnesium sulfate from dead sea water with the production capacity of 35,000tpy and 70,000tpy after expanded.

The Iranian refractory materials company produces 40,000t of dead burned magnesia and 25,000t of caustic calcined magnesia.

In India, the Almora Magnesite Co. has two shaft kilns producing 30,000t of caustic calcined magnesia and dead burned magnesia.

There are three major producers in North Korea, and the Korean Magnesia Industry Group produces 100,000t of dead burned magnesia, 20,000t of caustic magnesia and 5,000t of fused magnesia every year.

Europe:

In Europe, Baymag is the member of Refratechnik group, which is at the first class in technology of refractory materials production. The company produces 80,000t of caustic calcined magnesia every year, mainly supplying to the North American market. Their products are used as the husbandry, chemical, water-purifying and refractory industries. Baymag expands its capacity by 50,000t last year and will put into production in the third quarter of 2009. If the demand for fused magnesia is strong in 2009, the company will restart the fused magnesia plant with 14,000tpy in Exshaw.

RHI AG is a world-class refractory materials supplier with 700,000t of refractory materials. The company produces dead burned magnesia in Austria and Turkey. To meet the demand for high-grade refractory materials, the company began to produce high grade magnesia in China by investing \$50,000,000 to Liaoning Jinding Magnesia Cor., Ltd. The two companies will cooperate to explore Huaziyu magnesite mine, whose reserve of magnesite is about 2.6 billion ton. The products will be high-purity magnesia 98%min and high-calcium fused magnesia 98%min, mainly used as the raw materials of magnesia carbon bricks. RHIAG has plants in Austria, China, South Africa and Italy.

The leading magnesite producer in Turkey planned to start production of fused magnesia and increase production capacity for dead-burned magnesia and magnesia-base refractories by year end. A smaller producer in Turkey planned to increase production capacity for dead-burned magnesia to 35,000 tons per year from the current level of 12,000 tons per year and begin producing fused magnesia by 2009. In February, Russia's leading magnesite producer acquired one of two magnesite producers in Slovakia and, later in 2008, announced plans to acquire the other producer. Kuma-Kutahya Mag Group began to produce fused magnesia in July. AS Mag Company belongs to RHIAG and supplies 140,000tpy of dead burned magnesia to refractory materials plants in European. And the Konya Kron Mag produces dead burned magnesia 84,000t every year.

Bommag Company was reorganized by Bomex (Serbia) and Calmag (Turkey) which has been ever controlled by Stryomagnesite Steriische. The strategy is exploring Turkish magnesite to meet the consumption of Bomex Refra Co. The output of caustic calcined

magnesia is 19,200tpy and will expand the capacity to 55,000tpy in spring of 2009.

In Spain, MGR produces 200,000t of magnesite every year. The company mainly produces 18,000t of caustic calcined magnesia 80%min, which mainly was used in environmental industry. Another company, NavarrasAa, was invested by Magna T, Roullier and CricanSA, with the capacity of 700,000t for dead burned magnesia and 60,000t for caustic-calcined magnesia.

Magnezit Group JSC who controls 99% of magnesite resource of Russia is the biggest magnesia and refractory producer in Russia. Meanwhile, the company has got 99.6% of shares of Slovomag Lubenik in 2008, and the next purpose is to get Sloebnske Magnezitove Zavody (SMZ) in Slovakia. The output of brucite is 800,000tpy. Another dead burned magnesia shaft kiln with the output of 55,000t is under construction.

In addition, British UCM group produces electro-fused magnesia 18,000t every year. Portolos Group in Greece produces 200,000t of caustic calcined and dead burned magnesia. Lhoist Group in Holland produces 16,500t of dead burned magnesia and 10,000t of caustic calcined magnesia. The premier in Ireland produces 85,000-90,000t for dead burned magnesia every year.

3.2 Magnesia production in China

As the largest magnesia production country in the world, China exports magnesia and magnesia products to more than 50 countries. The total output of magnesia in China is 350-400million ton in 2008, accounting for 50% of the world output. 129.77million ton were exported to overseas market. Affected by the economic recession, the export quantity decreased sharply from October. Many smelters stopped producing in the fourth quarter.

The major suppliers of magnesia in China are as follows:

Company	Products	Capacity	Output in 2008
Dashiqiao Huameng Group	CCM DBM FM Mgo Carbon Bricks Fusedchrome magnesia	DBM:150,000t FM:50,000t	170,000-180,000t
Haicheng Huayu Group	DBM Mid-DBM High-purity Mgo	700,000t	500,000t
Haicheng Houying Group	DBM、Mid-DBM、 High-purity Mgo、 spinelle、 MgCa、 dolomites	Total in 900,000t, including 150,000t for Mgo-products and	700,000t

		Si-products, 250,000t for finished products and 10,000t of unshaped products.	
Haicheng Xiyang Group	DBM, Mid-DBM, High-purity Mgo, CCM and Mgo bricks	Mgo products: 2 million ton	1.2-1.3 million ton
Yingkou Jiachen	DBM, Mid-DBM, FM and gunning refractory	700,000t	540,000 吨
Dashiqiao Jinding Group	FM	120,000t	120,000t
Haicheng Mgo General Company	DBM CCM FM Magnesite	Magnesite: 6 million ton, DBM: 400,000t CCM: 300,000t	DBM&FM: 330,000t CCM: 280,000t
Hartley (Haicheng) Magnesite Cor., Ltd	High-purity magnesia	High-purity MgO 96-98%: 60,000t, including 20,000t of high-purity Mgo 97.2% min.	50,000t

4. Market analysis and retrospect

4.1 Review

Export market in 2008: From January to early August, the export market kept strong. The export quotas released in the first half year have been booked before May. Most Chinese suppliers preferred to export dead burned magnesia and fused magnesia, whose prices were much higher than those of caustic calcined magnesia. The price of export license rose from RMB1,000/t at the end of 2007 to RMB1700/t before the Olympics. The major smelters only export their own materials and were reluctant to be as an agent. After a short term after the Olympics, the price of export license was further talked up to RMB2,500/t, but few deals were concluded due to the following financial crisis. However, most consumers have made great inventories for the production in the fourth quarter.

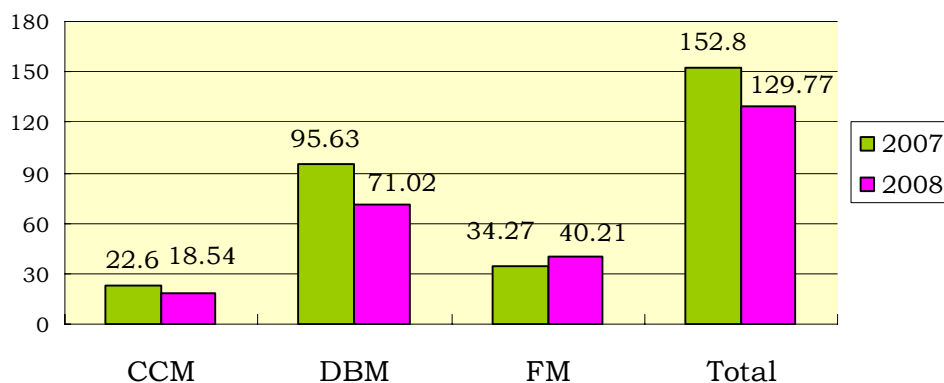
As consumers have purchased enough magnesia in the fourth quarter of 2007, the export market in the first two months was slow. Driven by the strong demand from steel mills in

the second and third quarters, magnesia suppliers have a few spot materials on hand in the first three quarters. In the fourth quarter, the market declined to the bottom. Meanwhile, the prices of fuel dropped greatly from October, so magnesia prices decreased gradually in the fourth quarter.

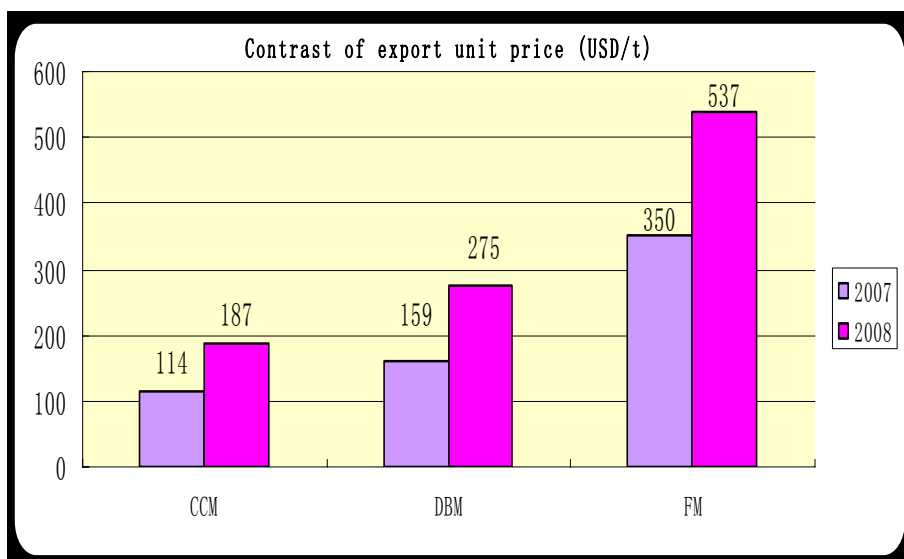
4.2 Analysis

Export market: According to the statistic of China Customs, the export quantities from January to December was 185,400t of caustic burned magnesia, 710,200t of dead burned magnesia and 402,100t of fused magnesia, with the total quantity of 1,297,700t, 15% less than that in 2007. Please refer to the detail in diagram

Contrast of export volume 2007/2008 (MT)

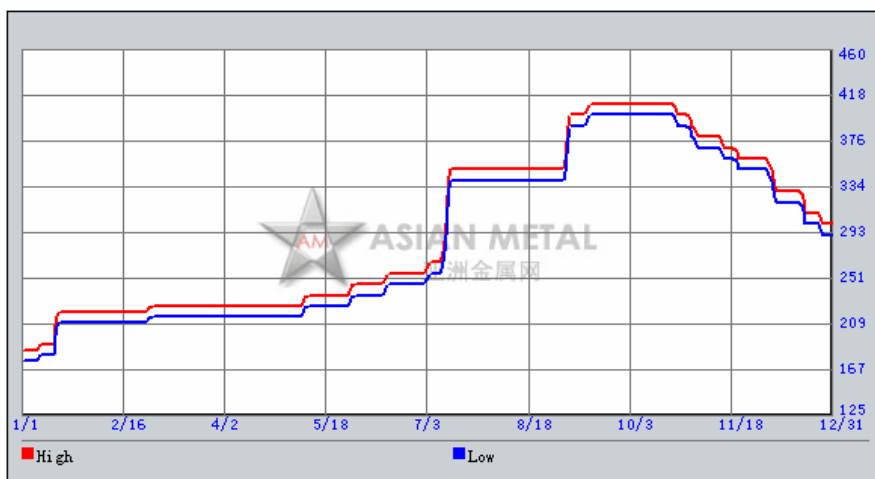


The foreign sales amount for export rose by 50% to USD446,000,000 in 2008, up USD298,000,000 in 2007. The unit price of caustic burned magnesia went to USD189/t compared with USD114/t in 2007, for dead burned magnesia rose from USD159/t in 2007 to USD275/t in 2008 and rose from USD350/t in 2007 to USD537/t in 2008 for fused magnesia.

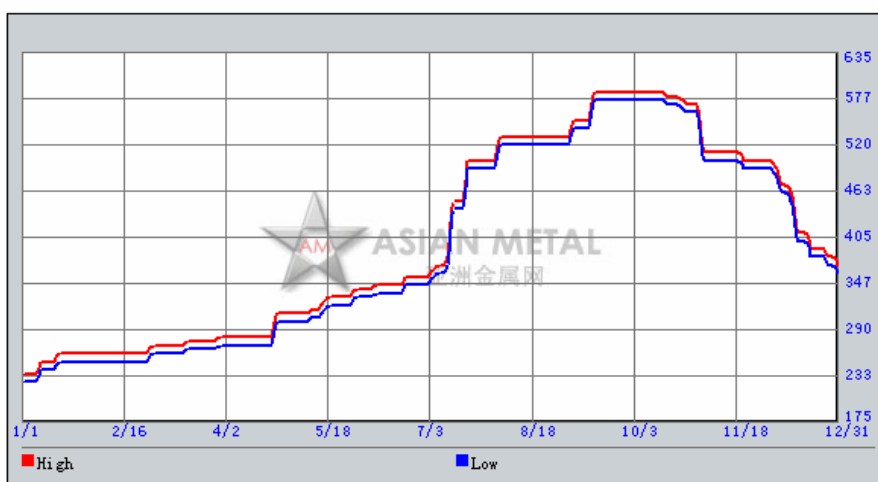


Export market: The magnesia prices were driven up by the increasing price of export licenses, production cost and strong demand. In the fourth quarter the market began to be quiet. Smelters adjusted down the export prices. The export quantity decreased by XX%. The great price decrease was attributed to the global financial crisis and economic recession, caused by the reduction of production in steel mills and metallurgical industries. In the fourth quarter, there were large quantities of spot material in stock. In the last two months, Chinese suppliers insisted on the price of export licenses in the range of RMB1,000-1,300/t, but foreign buyers have enough inventories that can meet the demand in the first two quarters of 2009. About the details, please see the following price curves:

Magnesite L.B. 90%min 200mm FOB China USD/mt
From 2008-1-1 To 2008-12-31



Magnesite D.B. 90%min 3-15mm FOB China USD/mt
From 2008-1-1 To 2008-12-31

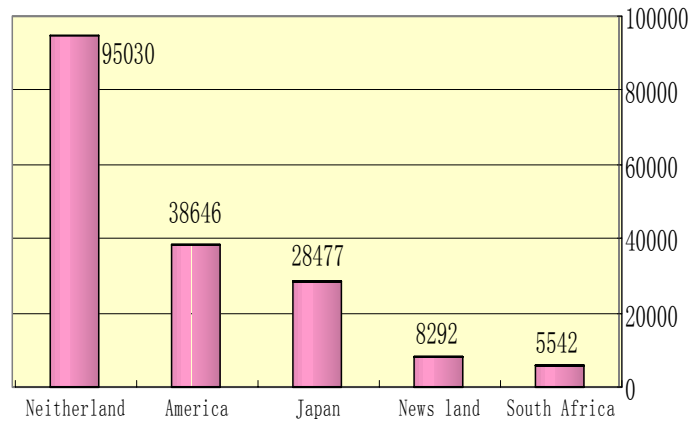


The top five countries who imported Chinese caustic calcined magnesia were Holland, America, Japan, New Zealand and South Africa. The top five countries who imported Chinese dead burned magnesia were America, Holland, Japan, South Korea, Ukraine, and South Africa. The five countries who imported fused Chinese were Holland, America,

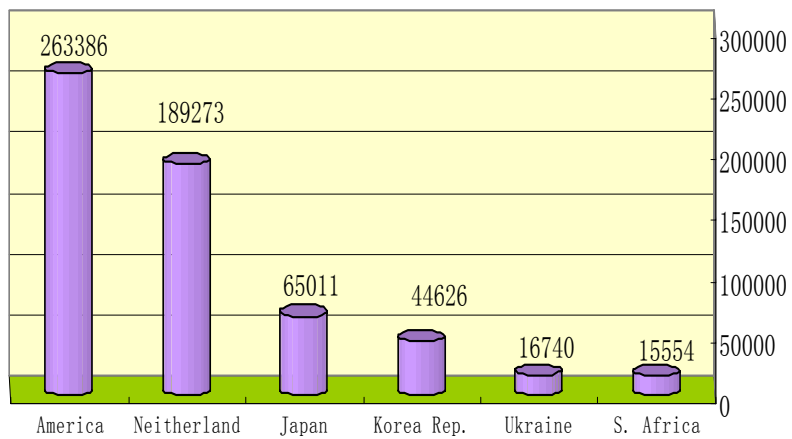
Japan, Russia, Italy, and Turkey.

The details as follows:

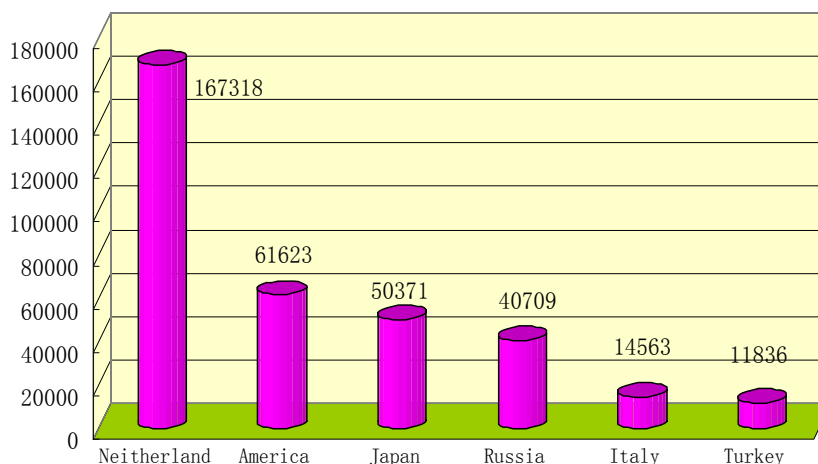
Top 5 countries imported CCM in 2008(t)



Top 6 countries imported DBM in 2008(t)



Top 6 countries imported FM in 2008(t)



Domestic market: The caustic burned magnesia market was stable generally in the first quarter with little changes of price. From the second quarter, caustic calcined magnesia rose along with the price increase of coal. The CCM 200mesh 90%min price increased from RMB450/t ex works in the first quarter to RMB750/t ex works in the June and July. Dead burned magnesia prices rose at the speed of RMB50-100/t every week from March to July on the basis of RMB650/t ex works. In the fourth quarter, the demand in the domestic softened and the prices of dead burned magnesia decreased to RMB800-850/t ex works. Fused magnesia prices changed with the power price and graphite electrode price. From May to July, fused magnesia increased by RMB400-500/t to around RMB3,000/t ex works for high-calcium fused magnesia 97%min. However, it dropped back to RMB2,500-2,600/t ex works at the end of 2008.

4.3 Main factors for magnesia market

4.3.1 Price of export licenses

The increasing price of export market is closely related with the price increase of export license. As the export quota was far away from the demand from overseas market, the price of export licenses rose from RMB800/t ex works to RMB2,500/t before the Olympics. 70% of the export quotas were used before the end of Olympic, and the left less than 30% were calculated at RMB1,000-1,300/t in the fourth quarter. Before the end of December, there still some export quotas went to be invalid, because suppliers did not receive enough orders. Some export quota might be calculated at below RMB1,000/t.

4.3.2 Demand

The demand in 2008 was mainly from the strong steel market, for the housing market kept firm in the first eight months. After the Olympics, the domestic market tended to be sluggish from late August, because steel mills reduced the output and many refractory materials producers stopped production. In the last two months, the demand for magnesia dropped to the bottom, and few deals were concluded for both domestic sales and exports.

4.3.3 Macro-policies

The export policy on magnesia did not change in 2008. The export duty was 5% on caustic calcined magnesia and was 10% on dead burned magnesia and fused magnesia. Before Olympics, Chinese customs cracked down smuggle heavily, which was another reason to lift up export licenses price.

4.3.4 Prices of raw materials and fuels

Along with the international crude oil price kept increasing in the first eight months, other energy prices also rose quickly, which caused the price increase of magnesia. Meanwhile, the cost on freight went up slightly. For example, the price of blind coal increased from RMB1,100-1,200/t delivered to RMB1,900-2,000/t delivered, and brown coal prices rose from RMB300/t in January to RMB600-700/t delivered. Under the pressure of graphite electrode price increase, fused magnesia smelters raised the prices by RMB400-500/t in June and July.

5. Outlook for magnesia market in 2008

Dead burned magnesia is widely used to steel, cement, glasses and nonferrous industries as the refractory bricks and forging refractory materials. Fused magnesia is mainly used as magnesia bricks in steel mills. The financial crisis has crept to the enterprises, such as steel mills and nonferrous industries. The demand for magnesia will be cut down by 30-40% all over the world, especially from developed countries. In recent years, many companies have made research and development of all kinds of magnesia, which was mainly applied to environmental, fire retardant, agricultural, hydrometallurgy and medication.

5.1 export market

In 2009, magnesia market is being affected by financial crisis and economic recession. The demand from overseas market will decrease from steel and metallurgical mills. In the first half of 2009, the demand for magnesia is not the half of that in the same time of 2008.

In the first four months, consumers are using their inventories and there are few spot deals. The export quantity will increase in the third quarter when many consumer need to replenish inventories. Therefore, the export prices will drop greatly, and the price of export license is expected to drop to RMB400-500t, nearly the same with the tender price.

Meanwhile, smelters in other countries will reduce the output of magnesia according to the decrease of orders. The profits will be pressed further all through this year. More companies have begun to produce magnesia in order to reduce the dependence on Chinese magnesia supply.

5.2 Domestic market

Though all the countries are experiencing the economic recession, Chinese economy may recover from the second half of this year driven by the great investment on infrastructure constructions. In the first half of this year, Chinese domestic steel mills have not resume production or produce normally, and there are large quantities of spot materials. To reach the target of 8% for GDP, most steel mills and non-ferroalloys smelters will resume production from the second quarter, and then there will be 85% of magnesia smelters at operation, but they may produce at half of their capacity. In 2009, the fuel price will keep stable generally, so the production cost will not change greatly. The magnesia price will continue to drop in the first half of this year due to the slow demand and it will tend to be stable and rise slightly from late May or June.