



2006 Minerals Yearbook

MAGNESIUM

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Primary magnesium was produced by one company in the United States, and much of the U.S. consumption was met by imports. Canada, Israel, and Russia were the principal sources of imported magnesium. Aluminum alloying, diecasting, and iron and steel desulfurization, in descending order, were the principal end-use applications for magnesium in the United States in 2006. China continued to dominate world production of primary magnesium, accounting for 77% of the total (excluding the United States). This percentage is expected to increase because Norsk Hydro ASA announced that it would close its 54,000-metric-ton-per-year (t/yr) primary magnesium plant in Canada in the first quarter of 2007.

Legislation and Government Programs

The NAFTA Secretariat announced its decision on the second remand of the U.S. International Trade Commission's (ITC) 5-year review of the antidumping and countervailing duties on pure and alloy magnesium from Canada. The panel concluded that the ITC should revisit its determination on remand for alloy magnesium. The ITC must provide further evidence to support its conclusion that Magnola Metallurgy Inc. would enter the market by reducing its price in order to establish export volumes that would be significant in relation to anticipated demand increases (NAFTA Secretariat, 2006).

After a 2005 North American Free Trade Agreement (NAFTA) binational panel decision to uphold countervailing duties on pure and alloy magnesium for Magnola that had been determined from a new shipper review in 2003 (7% ad valorem), the company appealed this decision to the U.S. Court of International Trade. Magnola claimed that ITA's imposition of duties was based on an incorrect finding that the Quebec government's manpower training program provided a specific subsidy to the company. The court denied Magnola's motion because the nonrecurring subsidy was addressed during the new shipper review and subsequently sustained by a NAFTA binational panel (U.S. Court of International Trade, 2006).

The ITC also completed full 5-year (sunset) reviews of antidumping duties on pure magnesium from China and antidumping and countervailing duties on imports of pure and alloy magnesium from Canada. The ITC determined that revoking antidumping and countervailing duties on pure and alloy magnesium from Canada would be unlikely to lead to material injury, but that revoking the antidumping duty on pure magnesium from China would be likely to cause injury (U.S. International Trade Commission, 2006).

In its final determination of the review of the antidumping duty on pure magnesium from China, the U.S. Department of Commerce, International Trade Administration (ITA)

determined that pure magnesium from Tianjin Magnesium International Ltd. (TMI) would not be subject to any antidumping duty. Magnesium from other exporters in China would continue to be subject to a 108.26% ad valorem duty. TMI was eligible for separate treatment under the review because it was determined that the company was not under government control with regard to its exports. The period of review was May 1, 2004, to April 30, 2005 (U.S. Department of Commerce, International Trade Administration, 2006b).

After the ITA determined that pure magnesium from TMI would not be subject to any antidumping duty, U.S. Magnesium LLC filed an appeal of the 0% duty with the U.S. Court of International Trade. In addition to what it said were erroneous calculations, U.S. Magnesium said that the ITA did not apply TMI's cash deposit rate solely to TMI and the Chinese producer that supplied TMI with the pure magnesium. U.S. Magnesium requested that the Court order the ITA to restrict the 0% rate to TMI and the one supplier so that other magnesium producers in China do not take advantage of TMI's rate to ship magnesium to the United States (Platts Metals Week, 2006e).

In response to a "scope ruling request" filed in August 2005 by U.S. Magnesium alleging that Timminco Ltd. of Canada and Pechiney of France evaded U.S. antidumping duties by remelting ingots or pure magnesium pieces from China and Russia and exporting them to the United States as Canadian- or French-origin magnesium, the ITA preliminarily determined that pure magnesium ingot and butt-end imported from China and processed by Pechiney in France were subject to antidumping duties on magnesium from China. It was the ITA's opinion that the magnesium did not undergo substantial transformation during processing and therefore could not be classified as being French origin (Lerner, 2006).

The ITA also preliminarily determined that magnesium alloy extrusion billets imported from Timminco were not covered by antidumping duties on magnesium from Russia or China. Timminco demonstrated to the ITA that the billets were a product of Canada (Platts Metals Week, 2006a).

After conducting an expedited 5-year (sunset) review concerning the antidumping duty order on imports of pure granular magnesium from China, the ITA determined that the duties would remain at the level of 305.56% ad valorem that was established in 2001 (U.S. Department of Commerce, International Trade Administration, 2007).

The ITA began an administrative review of the antidumping duty on magnesium metal from Russia in June. The time period to be reviewed was October 4, 2004, to March 31, 2006. The final results were expected to be available no later than April 30, 2007 (U.S. Department of Commerce, International Trade Administration, 2006a).

Production

U.S. Magnesium was the sole producer of primary magnesium in the United States. The company recovered magnesium electrolytically from brines from the Great Salt Lake at its 45,000-t/yr plant in Rowley, UT.

Environmental Issues

The cover gas sulfur hexafluoride (SF_6) that is used to protect molten magnesium from oxidation has been implicated as a potential factor in global warming. Although studies on its effect continue, its long atmospheric life (about 3,000 years) and high potential as a greenhouse gas (23,900 times the global warming potential of carbon dioxide) has resulted in a call for voluntary reductions in its emissions. In 1999, the U.S. magnesium industry, the International Magnesium Association, and the U.S. Environmental Protection Agency (EPA) began a voluntary partnership to understand and reduce emissions of SF_6 . The major processes that require SF_6 melt protection are primary production; secondary production; die, permanent mold, and sand casting; wrought products; and anode production. According to the EPA, SF_6 emissions from primary magnesium production and magnesium casting in 2005 increased slightly from those in 2004, although they remained significantly lower than the 1990 baseline level (U.S. Environmental Protection Agency, 2007a, p. 4-64–4-66).

The EPA collaborated with the International Magnesium Association, the China Magnesium Association (CMA), and the Japan Magnesium Association to write and publish a technical brochure discussing climate-friendly magnesium melt protection technologies. The “Alternatives to SF_6 for Magnesium Melt Protection” brochure, published in three languages, was introduced at the 63d Annual World Magnesium Conference in Beijing, China, in May (U.S. Environmental Protection Agency, [2007]b).

Pennsylvania’s Department of Environmental Protection (DEP) filed suit in the Lawrence County Court asking the court to order Reactive Metals and Alloy Corp. (Remacor), West Pittsburg, PA, to stop accepting deliveries of magnesium scrap. The DEP claimed that a fire in August 2005 destroyed all the plant’s equipment so that Remacor has not been able to process scrap since the fire and that the stored scrap represented a flammable hazard. The DEP claimed that more than 1,700 metric tons (t) of magnesium scrap is stored at the site (Marley, 2006b).

After an investigation that began in June, the EPA reached an agreement with Halaco Engineering Co. to begin cleanup at the 43-acre site of the company’s defunct magnesium recycling plant in Oxnard, CA. The plant, which closed in 2004 after filing for Chapter 11 bankruptcy protection in 2002, reportedly did not clean up a waste pile 30 to 50 feet tall at the plant site. Preliminary samples collected at the site exhibited elevated levels of heavy metals content (Marley, 2006a). The previous owners of Halaco began operating the MagPro LLC magnesium recycling facility in Camden, TN, earlier in 2006.

Consumption

Data for magnesium metal are collected from two voluntary surveys of U.S. operations by the U.S. Geological Survey. Of the 77 companies canvassed for magnesium consumption data, 67% responded, representing 62% of the magnesium-base scrap consumption listed in table 2 and the primary magnesium consumption listed in table 3. Data for the 25 nonrespondents were estimated on the basis of prior-year consumption levels and other factors.

Reported primary magnesium consumption in 2006 was about 5% lower than the revised data for 2005 (table 3). Consumption of primary magnesium for diecasting applications was 24% less than that in 2005. Aluminum alloying was the principal use for primary magnesium, accounting for 43% of the total, followed by diecasting with 33% and iron and steel desulfurization with 10%. Some of the drop in U.S. diecasting production was attributed to a decline in production of light vehicles in North American, which fell by more than 3% from 2005 to 2006 (Morgan & Company Inc., 2007).

In January, MagPro reportedly began limited operations at its newly opened magnesium recycling plant. Although no capacity figures were reported, the company planned to employ about 100 people when it reaches full capacity; under limited operation, the plant employed 8 to 12 people (Platts Metals Week, 2006d).

In February, Canadian firm Opta Minerals Inc. purchased United States firm Magnesium Technologies Inc. for an undisclosed amount. Magnesium Technologies produced magnesium desulfurization reagents and had a production facility in Walkerton, IN. The company imported a mixture of magnesium and lime from China and blended the material at the Walkerton facility. Magnesium Technologies originally was Rossborough Manufacturing Inc. before several reorganizations and filing for Chapter 11 bankruptcy (McBeth, 2006).

In June, Allegheny Technologies Inc. (ATI) announced that it would build a new titanium sponge facility in Rowley with a capacity of 10,900 t/yr. ATI projected that initial production would begin in the third quarter of 2008. This titanium expansion would bring ATI’s total titanium sponge capacity to approximately 18,100 t/yr. ATI previously had announced three titanium sponge capacity increases at its Albany, OR, facility totaling 7,260 t/yr (Allegheny Technologies Inc., 2006). This additional titanium sponge capacity would provide an increased market for magnesium in sponge production. The Rowley location is near U.S. Magnesium’s primary magnesium plant.

Spartan Light Metals Inc. agreed to acquire Intermet Inc.’s idle plant in Hannibal, MO, to expand its magnesium diecasting operations. Spartan already operated two magnesium diecasting facilities in Sparta, IL, and Mexico, MO. Spartan planned to bring the new facility onstream by 2007 (American Metal Market, 2006). Intermet, which emerged from Chapter 11 bankruptcy in 2005, also operated a magnesium diecasting plant in Monroe City, MO.

After its line of credit was terminated, Northern Diecast Corp. announced that it closed its magnesium diecasting plant in Harbor Springs, MI, in August. The company produced

magnesium diecastings primarily for the automotive industry (Magnesium.com, 2006a).

Meridian Technologies Inc., which claimed to be the world's leading magnesium diecasting company, was to be acquired for \$175 million by a consortium of investors led by the Swiss holding company Estatia AG. Current owners of Meridian—Teksid SpA of Italy (a subsidiary of Fiat Group) and Norsk Hydro—agreed to sell 100% of the equity of the company to the consortium in an all-cash transaction financed through a combination of debt and equity. Meridian Technologies operated magnesium diecasting facilities in Canada, China, Italy, the United Kingdom, and the United States (Burgert, 2006a).

Automotive component supplier Dana Corp. began supplying cylinder-head cover modules to Ford Motor Co. for the 3.0-liter Duratec V-6 engine in the Ford Freestyle, Ford Five Hundred, and Mercury Montego vehicles. The cylinder-head cover modules were produced using a thermoplastic material, which Dana claimed was lighter and delivers significant cost savings compared to the magnesium cover that it replaced. The company also claimed that, like magnesium, the thermoplastic material can be recycled (Burgert, 2006b).

Stocks

Producers' yearend 2006 stocks of primary magnesium decreased slightly from those at yearend 2005; producer stock data were withheld to avoid disclosing company proprietary data. Consumer stocks of primary and alloy magnesium were 4,940 t at yearend 2006, slightly less than the yearend 2005 level of 5,070 t (revised). Secondary magnesium stocks of 2,390 t at yearend 2006 were about 5% higher than the 2,270 t at yearend 2005.

Prices

In general, U.S. magnesium prices fell throughout the first three quarters of 2006, then increased significantly during the last quarter (table 4). At the beginning of 2006, the U.S. spot Western price range for magnesium was \$1.15 to \$1.30 per pound. This fell to a low for the year of \$1.10 to \$1.15 in mid-July. In mid-October, the price range began to increase rapidly, reaching \$1.35 to \$1.45 at yearend. The principal factor responsible for the price increase was Norsk Hydro's announcement that it would close its Becancour, Quebec, Canada, primary magnesium plant by the first quarter of 2007. Another factor that contributed to the fourth quarter price increase was a feedstock supply interruption at VSMPO-Avisma Corp.'s primary magnesium plant in Berezniki, Russia. European and Chinese primary magnesium prices increased steadily throughout 2006.

Foreign Trade

Total magnesium exports for 2006 were about 28% higher than those in 2005. Canada (64%), Mexico (14%), and Brazil (10%) were the principal destinations (table 5). Imports for consumption in 2006 were 11% lower than those in 2005. Of the total quantity of magnesium imported into the United

States, Canada (53%), Russia (17%), and Israel (14%) were the principal sources in 2006. Of the magnesium imported in 2006, 42% was as pure metal, and 33% was in the form of alloys. Canada supplied 74% of the magnesium alloy imports, and Canada, Israel, and Russia together provided 93% of the pure magnesium imports in 2006 (table 6).

World Review

Australia.—In October, Australia-based Advanced Magnesium Ltd.'s wholly owned subsidiary Advanced Magnesium Technologies Pty. Ltd. (AMT) signed an agreement with United States firm Chicago White Metal Casting Inc., Bensenville, IL, to develop a range of electroplated applications using AMT's new proprietary magnesium alloy, AM-lite®. In September, AMT signed an agreement with a Chinese diecaster to jointly develop electroplated die-cast sanitaryware and domestic hardware products made from AM-lite®. The company agreed to purchase 10,000 t of the alloy over a 2-year period. In addition, AMT supplied AM-lite® to three other manufacturers of bathroom products, kitchenware, and hardware products in Asia and Europe (Advanced Magnesium Ltd., 2006). Advanced Magnesium was formed from the remnants of Australian Magnesium Corp. Ltd. after its failed attempt to construct a magnesium plant in Australia.

Although Latrobe Magnesium Ltd. signed a coal fly ash supply agreement with Hazelwood Power, extending its original agreement by 3 years, the company decided not to begin a bankable feasibility study because of the state of the magnesium market. In 2001, Latrobe Magnesium had announced plans to construct a magnesium metal recovery plant in Victoria using coal fly ash as a raw material. The company instead decided to attempt to refine the ash processing steps (Latrobe Magnesium Ltd., 2007, p. 4).

Canada.—At the end of October, Norsk Hydro announced that it would close its Becancour, Quebec, 54,000-t/yr primary magnesium plant during the first half of 2007 and exit the magnesium industry. The company had been looking for a buyer for the plant since July. The timing of the closure coincided with the end of a 10-year supply contract with General Motors Corp. As a result of Norsk Hydro's decision to exit the magnesium industry, the company also planned to divest its magnesium casthouses in Bottrop, Germany (15,000 t/yr), and in Xi'an, China (15,000 t/yr). Competition from low-cost magnesium from China was cited as the reason for the company's decision (McBeth and de Klerk, 2006). The company had closed its magnesium casthouse operation in Porsgrunn, Norway, in June. (The primary magnesium plant in Porsgrunn was closed in 2002, but continued to operate as a 20,000-t/yr recycling and remelting facility at the site.)

In November, Timminco announced that it would restructure its magnesium operations in Haley, Ontario. The restructuring involved outsourcing the production of some of the company's specialty metals products to China to reduce manufacturing costs. This move would result in the elimination of 45 positions and the idling of some equipment (Timminco Ltd., 2006). Timminco did not specify which operations would be moved to China.

After Falconbridge Ltd. and Noranda Inc. merged in 2005, Xstrata Plc acquired the merged company in August 2006. Falconbridge's 80% ownership of the closed 63,000-t/yr Magnola magnesium plant in Quebec was transferred to Xstrata with the merger (Xstrata Canada Inc., 2006).

China.—According to China's National Bureau of Statistics, China produced 613,000 t of magnesium in 2006, about 32% more than that in 2005. China imported only 3,300 t of magnesium and exported nearly 350,000 t in 2006 (Beijing Antaike Information Development Co., Ltd., 2007). According to the CMA, however, China produced 526,000 t of magnesium in 2006. The CMA listed its top 10 magnesium producers as follows (with 2006 production in parentheses): Taiyuan Tongxiang Magnesium Industry Co. Ltd. (83,000 t), Taiyuan Yiwei Magnesium Industry (Group) Co. Ltd. (45,000 t), Shanxi Wenxi Yinguang Magnesium Industry Group Corp. (41,800 t), Ningxia Huiye Magnesium Co. Ltd. (33,500 t), Ningxia Huayuan Magnesium Co. Ltd. (22,000 t), Shanxi Golden Trust Yiwei Magnesium Industry Corp. (15,100 t), Shanxi Wanke Jinrun Magnesium Products Co. Ltd. (14,700 t), Shanxi Xiaoyi Dongyi Coal and Electricity Aluminium Group Co. Ltd. (14,000 t), Shanxi Wenxi Hongfu Magnesium Co. Ltd. (12,000 t), and Shanxi Qizhen Magnesium Co. Ltd. (11,700 t) (Magnesium.com, 2007).

China's Government decided to remove the rebate on exports of steel and some nonferrous metals, including magnesium, beginning on September 15. Prior to its removal, the export rebate on magnesium had been 5% (Beijing Antaike Information Development Co., Ltd., 2006).

Shanxi Jingmei Alloy Co. Ltd. planned to double its magnesium alloy production capacity to 30,000 t/yr by the end of 2006. The increase was in response to improved market conditions. Most of the company's output was exported to Europe, Japan, and the Republic of Korea (Platts Metals Week, 2006c).

Egypt.—Magnesium International Ltd.'s (MIL) subsidiary Egyptian Magnesium Co. (EMAG) signed a memorandum of understanding (MOU) with El Nasr Mining Co., an Egyptian Government-owned mining company that holds a license for exploration and mining of magnesite at Sul Hamed in the far southeastern region of Egypt. The MOU covered the completion of an exploration program to confirm the quantity and quality of the available resource and plan a mining, crushing, and beneficiation operation. If the results of the exploration determine that the magnesite will meet its needs, EMAG planned to enter into an agreement with El Nasr Mining to supply its proposed 88,000-t/yr primary magnesium plant (Magnesium International Ltd., 2006a).

In the second quarter, MIL had increased the target capacity at the proposed plant to 108,000 t/yr, with phase I construction of 54,000 t/yr. The company also had reached a supply agreement with Egyptian Electricity Transmission Co. for electricity at a price less than 2 cents per kilowatt-hour (Magnesium International Ltd., 2006b). In the fourth quarter, however, MIL decided to close the office in Egypt, release the staff, and put the EMAG project on care and maintenance because of the company's inability to attract sufficient funding to move forward with the proposed plant (Magnesium International Ltd., 2007).

Korea, Republic of.—Steelmaker Pohang Iron and Steel Co. Ltd. (POSCO) announced it would invest \$25.5 million to build the country's first magnesium sheet plant in Suncheon, South Jeolla Province. The plant was expected to have a production capacity of 3,000 t/yr. An agreement between the company and the provincial government was signed at the end of June, and construction was scheduled to start in August. Production was expected to begin by mid-2007 (Magnesium.com, 2006b).

Mexico.—Canadian magnesium producer Timminco completed an expansion of its magnesium anode facility in Nuevo Laredo in April that doubled the plant's capacity. The expansion would allow Timminco to enter Mexico's anode market; the anodes produced before the expansion were for export only (Carroll, 2006).

Norway.—In April, Norsk Hydro announced that it would close its magnesium casthouse operation in Porsgrunn because of competition from lower cost Chinese magnesium in the European market. The company had closed its primary magnesium plant in Porsgrunn in 2002, but continued to operate a 20,000-t/yr recycling and remelting facility at the site (Platts Metals Week, 2006b).

Russia.—The carnallite feedstock supply to the VSMPO-Avisma primary magnesium plant in Berezniki was interrupted during the fourth quarter. OAO Uralkali, the major supplier of carnallite to VSMPO-Avisma had to shut down one of its mines in October because of flooding. VSMPO-Avisma reportedly reached an agreement with OAO Silvinit, a potash mining plant 30 kilometers from VSMPO-Avisma's plant, to supply the company with carnallite in sufficient quantities to operate the magnesium plant at full capacity (Russia Newswire, 2006).

Outlook

Most of the new primary magnesium plants that have been announced within the past 10 to 15 years have not been constructed, and the most recent construction of a new plant in Egypt has been postponed because of a lack of funding. In addition, during the same time period, plants in Canada, France, and Norway have closed, removing more than 100,000 t/yr of production capacity from the world market. Magnesium production and capacity in China has continued to increase rapidly, with production increasing to 534,000 t in 2006 from about 75,000 t in 1997. As a result, China has become the principal magnesium supplier to most of the world. Antidumping duties established in the United States, however, have essentially eliminated China from the United States market, which leaves Canada, Israel, and Russia as the principal United States suppliers. With the closure of Norsk Hydro's plant in Canada in the first quarter of 2007, a significant source of magnesium has been removed. With no additional suppliers to replace those from China and Canada, magnesium supplies in the United States were expected to be tight beginning in 2007.

These tight supplies were expected to lead to increased prices; this increase already began in 2006 on the anticipation of tight supplies. U.S. magnesium consumers began committing to 2008 annual contracts earlier in 2007 than in the previous year, and contract prices were reported to be significantly higher—about

\$1.70 per pound for 2008 compared with 2007 contract prices of \$1.20 to \$1.30 per pound. Consumers feared that prices would increase even further (McDonell, 2007).

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TABLE 1
SALIENT MAGNESIUM STATISTICS¹

(Metric tons unless otherwise specified)

	2002	2003	2004	2005	2006
United States:					
Production:					
Primary magnesium	W	W	W	W	W
Secondary magnesium	73,600	70,100	72,000	72,900 ^r	75,800
Exports	25,400	20,400	11,800	9,650	12,300
Imports for consumption	87,900 ^r	83,400	98,600 ^r	84,700	75,300
Consumption, primary	102,000	103,000	101,000	82,100 ^r	77,600
Yearend stocks, producer	W	W	W	W	W
Price ² dollars per pound	1.10-1.22	1.10-1.17	1.55-1.60	1.15-1.30	1.35-1.45
World, primary production ^e	432,000 ^r	509,000 ^r	595,000	622,000 ^r	689,000

^eEstimated. ^rRevised. W Withheld to avoid disclosing company proprietary data.

¹Data are rounded to no more than three significant digits.

²Source: Platts Metals Week.

TABLE 2
MAGNESIUM RECOVERED FROM SCRAP PROCESSED IN THE
UNITED STATES, BY KIND OF SCRAP AND FORM OF RECOVERY¹

(Metric tons)

	2005	2006
KIND OF SCRAP		
New scrap:		
Magnesium-base	16,300	16,100
Aluminum-base	37,200 ^r	39,900
Total	53,500 ^r	56,000
Old scrap:		
Magnesium-base	807	807
Aluminum-base	18,600	19,000
Total	19,400	19,800
Grand total	72,900 ^r	75,800
FORM OF RECOVERY		
Magnesium alloy ingot ²	W	W
Magnesium alloy castings	1,410	1,270
Magnesium alloy shapes	439	364
Aluminum alloys	56,200 ^r	59,300
Other ³	14,800	14,800
Total	72,900 ^r	75,800

^rRevised. W Withheld to avoid disclosing company proprietary data; included in "Other."

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes secondary magnesium content of both secondary and primary alloy ingot.

³Includes chemical and other dissipative uses, cathodic protection, and data indicated by symbol W.

TABLE 3
U.S. CONSUMPTION OF PRIMARY MAGNESIUM, BY USE¹

(Metric tons)

Use	2005	2006
For structural products:		
Castings:		
Die	33,500 ^r	25,600
Permanent mold	112	50
Sand	412	357
Wrought products ²	2,890 ^r	2,410
Total	37,000 ^r	28,400
For distributive or sacrificial purposes:		
Aluminum alloys	30,300	33,700
Cathodic protection (anodes)	3,020	3,000
Iron and steel desulfurization	7,410	7,570
Nodular iron	240	323
Reducing agent for titanium, zirconium, hafnium, uranium, beryllium	812	869
Other ³	3,300 ^r	3,690
Total	45,100	49,100
Grand total	82,100 ^r	77,600

^rRevised.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes sheet and plate and forgings.

³Includes chemicals and scavenger, deoxidizer, and powder.

TABLE 4
YEAREND MAGNESIUM PRICES

Source		2005	2006
Platts Metals Week:			
U.S. spot Western	dollars per pound	1.15-1.30	1.35-1.45
U.S. spot dealer import	do.	1.14-1.24	1.35-1.42
European free market	dollars per metric ton	1,560-1,700	2,000-2,100
Metal Bulletin:			
European free market	do.	1,590-1,600	2,050-2,150
China free market	do.	1,500-1,520	2,020-2,080

TABLE 5
U.S. EXPORTS OF MAGNESIUM, BY COUNTRY¹

Country	Waste and scrap		Metal		Alloys		Powder, sheets, tubing, ribbons, wire, other forms	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2005:								
Brazil	--	--	--	--	420	\$1,010	9	\$246
Canada	4,790	\$10,800	701	\$2,340	205	1,730	365	3,800
Mexico	458	1,280	13	45	302	849	1,070	4,760
United Kingdom	24	69	--	--	58	269	244	6,170
Other	360	895	18	87	214	2,020	396	7,460
Total	5,630	13,100	732	2,470	1,200	5,870	2,080	22,400
2006:								
Brazil	--	--	19	41	1,230	3,220	5	161
Canada	3,450	7,860	3,490	7,810	481	1,720	507	4,770
Mexico	207	502	498	1,150	74	249	978	5,800
United Kingdom	--	--	3	6	1	6	269	6,150
Other	17	44	168	504	505	3,000	422	8,640
Total	3,680	8,410	4,170	9,520	2,290	8,200	2,180	25,500

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF MAGNESIUM, BY COUNTRY¹

Country	Waste and scrap		Metal		Alloys, magnesium content		Powder, sheets, tubing, ribbons, wire, other forms, magnesium content	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2005:								
Canada	8,910	\$12,400	4,810	\$15,000	24,500	\$83,200	833	\$7,280
China	693	995	19	32	693	2,310	26	276
Israel	--	--	9,040	29,700	5,560	23,300	--	--
Kazakhstan	--	--	974	2,670	--	--	--	--
Russia	--	--	11,800	27,400	768	1,710	143	599
Other	5,060	9,320	2,120 ^r	5,880 ^r	8,720	28,100	40	1,910
Total	14,700	22,700	28,700	80,700	40,300	139,000	1,040	10,100
2006:								
Canada	11,500	14,200	8,780	21,500	18,800	64,800	580	5,200
China	216	353	1	7	335	730	243	1,430
Israel	--	--	7,920	22,000	2,610	8,410	--	--
Kazakhstan	--	--	1,300	2,850	--	--	--	--
Russia	--	--	13,000	26,300	--	--	9	185
Other	5,480	9,180	912	2,340	3,420	14,300	95	3,280
Total	17,200	23,700	31,900	74,900	25,200	88,200	927	10,100

^rRevised. -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 7
WORLD ANNUAL PRIMARY MAGNESIUM
PRODUCTION CAPACITY, DECEMBER 31, 2006^{1,2}

(Metric tons)

Country	Capacity
Brazil	12,000
Canada	123,000 ³
China	602,000
India	900
Israel	27,500
Kazakhstan	10,000
Russia	46,000
Serbia and Montenegro	5,000
Ukraine	15,000
United States	45,000
Total	886,000

¹Includes capacity at operating plants as well as at plants on standby basis.

²Data are rounded to no more than three significant digits; may not add to total shown.

³Includes 63,000 metric tons per year of idle capacity.

TABLE 8
MAGNESIUM: ESTIMATED PRIMARY WORLD PRODUCTION, BY COUNTRY^{1,2}

(Metric tons)

Country	2002	2003	2004	2005	2006
Brazil	6,000	6,000	6,000	6,000	6,000
Canada ³	80,000 ^r	78,000 ^r	54,000	50,000 ^r	50,000 ^p
China	250,000	340,000	442,000	470,000	534,000
Israel	26,000	26,000	28,000	27,853 ^{r,4}	24,500 ⁴
Kazakhstan	18,000	14,000	18,000	20,000	21,000
Norway	10,000	--	--	--	--
Russia ³	40,000	43,000	45,000	45,000	50,000
Serbia and Montenegro ⁵	1,695 ⁴	1,600	1,600	1,500	1,500
Ukraine	3	3	3	2,000	2,200
United States	W	W	W	W	W
Total	432,000 ^r	509,000 ^r	595,000	622,000 ^r	689,000

^pPreliminary. ^rRevised. W Withheld to avoid disclosing company proprietary data; not included in "Total." -- Zero.

¹World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Table includes data available through July 17, 2007.

³Includes secondary.

⁴Reported figure.

⁵In June 2006, Montenegro and Serbia formally declared independence from each other and dissolved their union. Mineral production data for 2006, however, still reflect the unified country.