

Mineral Industry Surveys

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MAGNESIUM IN THE THIRD QUARTER 2003

Exports of magnesium through August 2003 were about 16% higher than those in the same period of 2002. Magnesium imports through August 2003 were about 4% less than those in the corresponding period of 2002. Russia (66%) and Israel (18%) were the principal sources of imported metal. Canada (53%) and China (31%) were the principal sources of imported alloys.

Quoted magnesium prices are shown in the table at the bottom of the page. Prices remained fairly stable through the third quarter, with the exception of the quoted European free market prices. Beginning in October, Metal Bulletin stopped publishing a European free market price and began publication of a world free market price.

On September 24, the Office of the U.S. Trade Representative filed a request for an extraordinary challenge committee to review the decisions issued by the NAFTA panel on the final antidumping duty determinations on imports of pure magnesium from Canada. This panel will be established to act in place of national courts to review the final determination on the full sunset review to determine whether it conforms with the antidumping duty law of the country that made the determination. After several remands of the original antidumping decision, the NAFTA Secretariat had made the International Trade Administration remove the antidumping duty in July (U.S. Department of Commerce, International Trade Administration, 2003).

The U.S. Environmental Protection Agency issued its final rule on emissions of hazardous air pollutants for primary magnesium plants. The rule affects only U.S. Magnesium LLC, which must comply with the regulations before October 11,

2004. The final rule sets emission limits for chlorine (Cl), hydrochloric acid (HCl), particulate matter (PM), particulate matter less than 10 micrometers in size (PM10), and dioxin/furan. The emission points covered by the rule are the spray dryers (HCl, PM), magnesium chloride storage bins (HCl, PM10), melt-reactor system (Cl, HCl, PM10, dioxin), and the launder offgas system (Cl, HCl, PM). The standard also addresses fugitive dust emissions (U.S. Environmental Protection Agency, 2003).

The reorganization of Magnesium Corp. of America (Magcorp) and Renco Metals Inc. was converted from a Chapter 11 to a Chapter 7 bankruptcy reorganization. The conversion requires Magcorp and Renco Metals to file a list of the unpaid debts that were accumulated since the August 2, 2001, Chapter 11 filing. An investigation by the trustee led him to believe that actions by the chief executive officer of Magcorp and Renco Metals and others made the companies insolvent. The trustee expected that money could be recovered more efficiently under a Chapter 7 filing than under a Chapter 11. The lawsuit is expected to have no effect on U.S. Magnesium, but officers of Magcorp, who are now officers of U.S. Magnesium, are being sued (Platts Metals Week, 2003c).

Magnesium International Ltd. raised A\$2.9 million in a rights issue that closed on June 30, 2003. The company attempted to raise A\$8.3 million through the offering. Although the company had an additional 3 months to raise the remaining funding, it decided not to make placements of the shortfall shares within the permitted period. Instead, Magnesium International decided to operate within the constraints of the available funding. As a result, the company began a detailed

	Unit	Beginning of quarter	End of quarter
Metals Week U.S. spot Western	Dollars per pound	\$1.05-\$1.12	\$1.05-\$1.10
Metals Week U.S. spot dealer import	do.	1.01-1.08	1.03-1.08
Metals Week European free market	Dollars per metric ton	1,750-1,850	1,850-1,950
Metal Bulletin European free market	do.	2,000-2,050	1,760-1,810
Metal Bulletin China free market	do.	1,620-1,650	1,620-1,650

evaluation of all costs and has made changes to try to reduce ongoing expenditures. (Magnesium International Ltd., 2003§¹).

Despite the financial difficulties faced by other proposed magnesium plants in Australia, Latrobe Magnesium Ltd. was trying to fund a bankable feasibility study for its proposed 100,000-metric-ton-per-year (t/yr) magnesium-from-coal-fly-ash project. An earlier initial scoping study indicated that the company would need \$13.7 million to fund the feasibility study. A number of avenues for funding were being pursued, including the Alternative Investment Market in London, the Toronto Stock Exchange, local brokers, and potential investors both in Australia and overseas. In conjunction with Alcan International Inc., a pilot plant has been sized, and the company has been examining a selection of potential locations within the La Trobe Valley for the pilot plant site. Latrobe Magnesium was finalizing the contract details with Alcan International for the supply of the dehydration technology and the subsequent commercialization of that process. Discussions were underway with potential organizations for offtake agreements (Metal Bulletin, 2003).

China continued to increase its production capacity for magnesium ingot and alloy and announce future increases. Many of the future increases, however, will depend on funding from outside investors. In August, Shanxi Wenxi Baiyu Co. Ltd. completed the first phase of its expansion project to increase its magnesium production capacity to 10,000 t/yr from 5,000 t/yr. The company announced that it would expand production capacity further to 30,000 t/yr by the end of 2003. Shanxi Reicheng Hengfa Corp. planned to increase its magnesium ingot production capacity to 12,000 t/yr from 4,000 t/yr by March 2004. The company also announced that it would begin a 15,000-t/yr magnesium alloy project in 2004 (Nordic Magnesium Cluster, 2003a§). In August, Jilin North Industrial Silicon Corp. installed new alloy production capacity and upgraded its equipment to increase the company's combined alloy and ingot output to 12,000 t/yr—6,000 t/yr of ingot production and 6,000 t/yr of alloy production (Nordic Magnesium Cluster, 2003b§).

Ningxia Huayuan Magnesium Smelter added 6,000 t/yr of production capacity to its primary magnesium plant, bringing the total capacity up to 14,000 t/yr. The increased production was formerly planned for the export market but because the company claimed that it takes too long to receive payment from abroad and to collect the export rebate from the Chinese Government, only 50% of its production will be exported (Nordic Magnesium Cluster, 2003c).

A new China-Hong Kong joint-venture magnesium firm, Yuxing Hongfu Magnesium Co., planned to construct a 50,000-t/yr magnesium plant in Shanxi Province. The first phase of 10,000 t/yr was scheduled to be completed in October, and the second phase of 20,000 t/yr was scheduled for August 2004. The entire project was to be completed by 2005 (Platts Metals Week, 2003a).

Russia's second largest aluminum maker, SUAL Holding, and Uralasbest announced that they would set up a company to recycle Uralasbest's asbestos production wastes to recover magnesium. The project is estimated to cost between \$100 million and \$300 million. The least expensive option would be

to set up magnesium production at Uralasbest's Malyshevskoye mines, making use of the existing buildings and concentrating plant. More than 4 billion metric tons of serpentinite wastes, with a magnesium content of 20% to 25%, have built up at Uralasbest. No timetable was scheduled for construction. The waste product at Uralasbest has been evaluated as a potential magnesium source material since 2000 (Magnesium.com, 2003b§).

After an investment group formed by some of Rossborough-Remacor LLC's managers failed to obtain purchase approval from the company's creditors, Rossborough-Remacor requested that the bankruptcy court auction its assets. The auction for the assets was scheduled for October 3, and the assets were to be sold as four separate entities—steel additives, magnesium recycling, refractory molding, and its Avon Lake, OH, real estate (Platts Metals Week, 2003b).

Ford Motor Co. chose aluminum instead of magnesium for the camshaft covers in its next-generation V-6 engines. The cost of magnesium compared to that of aluminum was cited as the main reason. Ford uses magnesium alloy AZ91 camshaft covers on its 5.4-liter Triton V-8 engines and is expanding its use to other Triton V-8 and V-10 engines, where it has replaced plastic. Ford said that most of its future engines would use aluminum camshaft covers unless the price of magnesium decreases and approaches that of competing aluminum alloys (Wrigley, 2003).

South Africa's Mintek expects to conclude a project to develop a thermal process to produce magnesium metal continuously by mid-2004 and will then seek to commercialize it with its partners Anglo American plc, Eskom Holdings Ltd., and South Africa's Department of Science and Technology. The project was begun 3 years ago, and the new technology entails continuously feeding calcined dolomite, which has been heated to greater than 600° C, and ferrosilicon into an electric furnace to produce magnesium vapor. This vapor then enters a unit where it condenses into liquid metal and slag, at a slag-to-metal ratio of 6 to 1. Mintek was successful in tapping of liquid magnesium directly from the condenser during operation of the plant, which would allow the process to operate continuously. In a pilot plant, Mintek produced 1,200 kilograms of magnesium during the last 12 months, with a quality significantly better than that from existing thermal processes. Mintek stated that further development work is needed to obtain all the necessary data on process performance and equipment design before a feasibility study can be initiated. The new process was designed to minimize the labor required to produce magnesium though a thermal batch process, which is the principal production method used in China. This would allow producers in countries where labor costs are higher than those in China to compete economically (Magnesium.com, 2003a§).

References Cited

- Metal Bulletin, 2003, Latrobe's Australian vision undimmed: Metal Bulletin, no. 8810, October 6, p. 20.
Platts Metals Week, 2003a, New JV builds 50,000mt Mg plant: Platts Metals Week, v. 74, no. 29, July 21, p. 8-9.
Platts Metals Week, 2003b, Rossborough-Remacor asks to auction its assets: Platts Metals Week, v. 74, no. 35, September 1, p. 3.
Platts Metals Week, 2003c, Trustee gets Chapter 7 for Magcorp, seeks litigator: Platts Metals Week, v. 74, no. 39, September 29, p. 9.
U.S. Department of Commerce, International Trade Administration, 2003, North American Free-Trade Agreement, Article 1904 NAFTA panel reviews; notice

¹References that include a section mark (§) are found in the Internet References Cited section.

of request for an extraordinary challenge committee: Federal Register, v. 68, no. 190, October 1, p. 56623.

U.S. Environmental Protection Agency, 2003, National emission standards for hazardous air pollutants for primary magnesium refining: Federal Register, v. 68, no. 197, October 10, p. 58615-58629.

Wrigley, Al, 2003, Magnesium loses allure as Ford turns to economical aluminum: American Metal Market, v. 111, no. 33-1, August 18, p. 4.

Internet References Cited

Magnesium.com, 2003a (September 21), Mintek develops new thermal process magnesium production method, accessed October 28, 2003, at URL http://www.magnesium.com/w3/news-room/news_open.php?news=1422.

Magnesium.com, 2003b (October 26), SUAL sets up venture to recycle Uralasbest waste, accessed October 28, 2003, at URL http://www.magnesium.com/w3/news-room/news_open.php?news=1490.

Magnesium International Ltd., 2003 (September 22), Business update, accessed October 28, 2003, at URL <http://www.mgil.com.au/default.asp?S=INVEST&A=2&V=336&T=ANN>.

Nordic Magnesium Cluster, 2003a (October 14), Chinese Mg smelter boosting output, accessed October 24, 2003, at URL <http://normac.teknologisk.dk/11371>.

Nordic Magnesium Cluster, 2003b (October 17), Jilin hikes magnesium and silicon output, accessed October 24, 2003, at URL <http://normac.teknologisk.dk/11377>.

Nordic Magnesium Cluster, 2003c (August 13), Ningxia Huayuan brings new capacity onstream, accessed October 27, 2003, at URL <http://normac.teknologisk.dk/10922>.

TABLE 1
U.S. IMPORTS FOR CONSUMPTION AND EXPORTS OF MAGNESIUM¹

(Metric tons)

	2003					
	2002	January- May	June	July	August	January- August
Imports:						
Metal	29,900	9,910	1,670	1,910	2,570	16,100
Waste and scrap	14,100	7,230	1,240	1,160	1,310	10,900
Alloys (magnesium content)	41,900	17,200	3,040	3,100	3,110	26,400
Sheet, tubing, ribbons, wire, powder, and other (magnesium content)	2,090	570	119	97	74	860
Total	88,000	34,900	6,060	6,260	7,060	54,300
Exports:						
Metal	11,300	5,520	677	493	580	7,270
Waste and scrap	5,850	2,370	397	301	448	3,520
Alloys (gross weight)	4,210	870	64	156	93	1,180
Sheet, tubing, ribbons, wire, powder, and other (gross weight)	4,010	1,970	332	261	404	2,970
Total	25,400	10,700	1,470	1,210	1,530	14,900

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

Source: U.S. Census Bureau.