

Mineral Industry Surveys

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MAGNESIUM IN THE FIRST QUARTER 2001

Domestic production of primary magnesium in the first quarter of 2001 was about the same as that in the fourth quarter of 2000, according to the U.S. Geological Survey. Producers' stocks in the first quarter of 2001 decreased by 9%, and shipments were 14% higher than those in the fourth quarter of 2000.

Exports of magnesium through February 2001 were 5% lower than those in the same period of 2000. Magnesium imports through February 2001 were 12% less than those in the corresponding period of 2000. Russia (38%) and Israel (28%) were the principal sources of imported metal. China (51%) and

Canada (23%) were the principal sources of imported alloys.

Total exports for 2000 were about 18% lower than those in 1999. Canada (51%), the Netherlands (10%), and Mexico (7%) were the main destinations. Imports for consumption in 2000 were slightly higher than those in 1999. Canada (40%), China (24%), Russia (15%), and Israel (9%) were the principal import sources in 2000.

With the exception of the China free market price, quoted prices of primary magnesium continued to decline. First quarter prices are shown in the following table.

	Units	Beginning of quarter	End of quarter
Metals Week U.S. spot Western	Dollars per pound	\$1.23-\$1.30	\$1.21-\$1.30
Metals Week U.S. spot dealer import	do.	1.05-1.15	1.00-1.10
Metals Week European free market	Dollars per metric ton	1,800-2,000	1,800-2,000
Metal Bulletin free market	do.	1,900-2,000	1,800-1,900
Metal Bulletin China free market	do.	1,300-1,310	1,350-1,390

On April 24, the International Trade Administration (ITA) of the U.S. Department of Commerce announced preliminary dumping determinations on U.S. imports of magnesium from China, Israel, and Russia. The preliminary dumping duties on imports from China were determined to be 8.76% ad valorem for Minmetals Precious & Rare Minerals Import and Export/China National Nonferrous Metals Industry Trading Group Corp. and 305.56% for all other companies in China. For Israel, the preliminary dumping duty was determined to be 12.68% ad valorem for Dead Sea Magnesium Ltd., and for Russia, the preliminary dumping duty was determined to be 0% ad valorem. The investigation period for China and Russia was April 1, 2000, though September 30, 2000, and the investigation period for Israel was October 1, 1999, through September 30, 2000. ITA's final determinations are scheduled to be announced by July 9, 2001, for the duties for Russia and Israel

and September 12, 2001, for the duties for China. If these duty determinations are upheld, importers of magnesium from China and Israel will be required to post a bond equal to the percentage margin of dumping. This dumping suit was initiated in October 2000 by Magnesium Corp. of America, and the United Steelworkers of America, and the suit was joined by the employees of Northwest Alloys Inc. on April 20, 2001 (U.S. Department of Commerce, 2001a, b, c).

In February, the ITA announced preliminary countervailing duties on magnesium imported into the United States from Israel for calendar year 1999. Based on its investigation, ITA set a preliminary countervailing duty rate of 13.39% ad valorem for Dead Sea Magnesium. After a public hearing, ITA is scheduled to make its final determination by July 9 (U.S. Department of Commerce, 2001d).

By February, Magnola Metallurgy Inc. was operating 10 of

its 24 magnesium electrolytic cells at its new 63,000-metric-ton-per-year plant in Quebec and expected to have the remaining cells commissioned by the end of the summer. Magnola expects to produce 30,000 tons of magnesium in 2001 (Platts Metals Week, 2001b).

Timminco Ltd. energized one of its two magnesium refining and alloying furnaces at its Haley, Ontario, casthouse at the end of March. Both furnaces were severely damaged by a fire in November 2000. The second furnace was scheduled to be energized by mid-April, and the facility was scheduled to recommence commercial production in the second quarter (Timminco Ltd., March 30, 2001, Timminco announces the energizing of one of its two magnesium refining and alloying furnaces, accessed April 24, 2001, at http://www.timminco.com/nr_010330.pdf).

Pechiney announced that it may close its 16,000-ton-per-year primary magnesium plant in Marignac, France. Although no final decision has been made, the company is claiming that competition from low-priced imports of Chinese magnesium led to heavy financial losses at its plant for the past 2 years. This plant is the only plant in the European Union that produces magnesium, and its shutdown would remove any justification for the existing antidumping duty on imports of magnesium from China (Metal Bulletin, 2001).

Work continues on the many proposed magnesium metal plants in Australia. A listing of the proposed magnesium metal projects throughout the world is shown in the table on page 4 of this report.

In February, Australian Magnesium Corp. Ltd. (AMC) acquired full ownership of the Stanwell Magnesium Project with its purchase of Fluor Australia Pty. Ltd.'s 5% interest; AMC already owned the remaining 95%. In April, AMC signed an agreement with Ford Motor Co. to supply them with 45,000 tons per year of magnesium. AMC already had a 5-year agreement with Ford in place; this new agreement doubles the length of the contract to 10 years. Under the revised agreement, the price paid by Ford will be fixed for 5 years in Australian dollars. In the second 5-year period, the price will be calculated with reference to then-prevailing market prices (Australian Magnesium Corp. Ltd., April 11, 2001, AMC signs new ten year supply contract with Ford, accessed April 23, 2001, via URL <http://www.austmg.com/html%20files/news.htm>).

Mt. Grace Resources NL awarded a contract for stage 1 of its feasibility study to Bateman Multiplex JV, which is a joint venture between Bateman Engineering Pty. Ltd. and Multiplex Constructions Pty. Ltd. The joint-venture firm began work on the study in February, and stage 1 was scheduled for completion in April 2001. Mt. Grace expects to award a separate contract for stage 2 of the study after the completion of stage 1. The final feasibility study is scheduled to be completed by the end of 2001 so that commercial production can begin by 2003 (Mt. Grace Resources Ltd., February 5, 2001, Mt Grace awards feasibility study contract, accessed February 6, 2001, via URL <http://www.mtgrace.com/>).

Pima Mining NL's SAMAG Ltd. subsidiary began a feasibility study for the construction of a magnesium plant in New Zealand. SAMAG is evaluating several possible sites where appropriate infrastructure and competitive energy prices are available including Hawkes Bay, Taranaki, and Southland.

The company proposes that the magnesite feedstock would be shipped from its deposit near Leigh Creek, South Australia. Initial studies suggest that the additional cost of transportation would be more than offset by the competitive energy costs, construction costs, and labor costs available in New Zealand. SAMAG proposes to establish a New Zealand-based company for the project, which would be extended a sublicense to use the Dow magnesium process technology. SAMAG's off-take agreement with ThyssenKrupp Metallurgie GmbH also would be extended to encompass the proposed New Zealand operation. SAMAG has nearly completed the feasibility study for its planned 52,500-ton-per-year magnesium plant based at Port Pirie, South Australia (Pima Mining NL, April 4, 2001, SAMAG investigates New Zealand production, accessed April 23, 2001, via URL <http://www.pima.com.au/pima.asp>).

Spectrum Technology Corp., a Bakersfield, CA-based market development firm, announced that it had entered into an agreement with a United Arab Emirates trading firm to complete a feasibility study to construct a magnesium extraction plant in that country. No specific details on the size and location of the plant were announced, but the feasibility study is scheduled to be completed within 4 months (Spectrum Technology Corp., March 6, 2001, Spectrum Technology begins feasibility [sic] study for magnesium extraction plant in United Arab Emirates, accessed March 13, 2001, via <http://www.spectrumtechnologycorporation.com/>).

Zunyi Titanium Works in Guizhou Province, China, started up a 5,000-ton-per-year electrolytic plant in February. By April, the plant was producing at a 2,000-ton-per-year rate, and the company hopes to reach full capacity by August (Platts Metals Week, 2001e). China also plans to begin operating a new magnesium alloy diecasting operation by mid-2001. The plant in Qingdao Province will have the capability to produce 16,000 diecastings per year, which are expected to be used mainly in mobile phones and the electronics industry (Platts Metals Week, 2001a).

Reactive Metals & Alloys Corp. (Remacor), a magnesium desulfurization reagent producer, filed for chapter 11 bankruptcy in March. The company plans to seek court authority to sell nearly all of its assets to Rossborough Manufacturing Co., another magnesium desulfurization reagent producer. Rossborough is expected to create a separate unit, Rossborough-Remacor LLC, for Remacor to transfer its assets; at the same time, Rossborough will transfer its assets to the newly formed company. Combining the two companies probably will lead to closure of some plants to reduce duplicative functions. Remacor said that the reason for its bankruptcy declaration was because of bankruptcy filings by several of its steel-producer customers (Platts Metals Week, 2001c).

Xstrata Magnesium Co. plans to open its new magnesium scrap recycling facility in Anderson, IN, by the third quarter. The plant will have an initial capacity of 25,000 tons per year of magnesium alloy from two lines that will process class I and class II scrap generated during the diecasting process (Platts Metals Week, 2001d).

The average 2001 model of a North American family vehicle was estimated to contain an average of 3.9 kilograms (8.5 pounds) of magnesium diecastings, an increase of 0.23 kilogram

(0.5 pound) from the average quantity in the 2000 model. Automakers are continuing to increase the magnesium components of several vehicle models. General Motors Corp. (GM) plans to use magnesium instrument support beams in its next generation of full-size Chevrolet and GMC vans that are due out in late 2002. This decision continues the use of the magnesium parts from when they were introduced in the vans in 1995. If 150,000 to 200,000 vans are built each year, this application will consume up to 2,450 tons of magnesium alloy per year (Wrigley, 2001b). Ford also chose magnesium alloy for the instrument panel support beams and transfer case housings in its redesigned 2002 Ford Explorer and Mercury Mountaineer sport-utility vehicles.

Recycled magnesium alloy produced by Spectrulite Consortium Inc. was approved for use in automotive applications. The company said that its class I scrap-derived alloys—AM60B, AM50A, and AZ91D—were approved by GM and DaimlerChrysler Corp. Spectrulite has the capacity to recycle 30,000 tons per year of magnesium scrap (Regan, 2001).

GM developed a new family of creep-resistant magnesium alloys that may have the potential to replace aluminum and iron in some large powertrain components such as engine blocks and transmission cases. The new alloys, named ACX alloys, have 40% greater tensile and 25% greater compressive creep resistance than alloy AE42, and, unlike AE42, they do not contain rare earths, which increase the cost of the alloy. The new alloys contain 4% to 6% aluminum, 1.5% to 3.5% calcium, and small quantities of strontium and/or silicon. The ACX alloys also demonstrated corrosion resistance equal to that of AZ91D, one the most common alloys used in current auto applications, but not suited for the higher temperatures found in powertrain applications (Wrigley, 2001a). Israeli magnesium producer Dead Sea Magnesium also reported the development of creep-resistant alloys, named MRI 15X. The company said

that diecasting tests for these alloys would begin in May. Although no specific composition was given, the new family of alloys contains aluminum, some alkaline earth elements, and very little rare earths (Wrigley, 2001c).

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- 2001b, GM keeps magnesium support beams: American Metal Market, v. 109, no. 72, April 13, p. 4.
- 2001c, Magnesium firm focuses on first application of new casting alloy: American Metal Market, v. 109, no. 74, April 17, p. 7.

Planned primary magnesium metal plants

Country, company, and web site (if available)	Location	Capacity (metric tons)	Process and raw material	Estimated start-up date
Australia:				
Australian Magnesium Corp. Ltd. (http://www.austmg.com/)	Gladstone, Queensland	60,000	Electrolytic, magnesite	2003
Crest Magnesium NL (http://www.crestmagnesium.com.au/)	Bell Bay, Tasmania	95,000	Electrolytic, magnesite	NA
Pima Mining NL (SAMAG) (http://www.pima.com.au/pima.asp)	Port Pirie, South Australia	52,500	Electrolytic, magnesite (Dow technology)	2003
Golden Triangle Resources NL (http://www.goldentriangle.com.au/)	LaTrobe Valley, Victoria	80,000	Electrolytic, asbestos tailings	2004
Mt. Grace Resources NL (http://www.mtgrace.com/)	Northern Territory	50,000	Thermal, magnesite	2003
Anaconda Nickel Ltd. (http://www.anaconda.com.au/)	Lenora/Laverton, Western Australia	100,000	NA, magnesite	NA
Congo (Brazzaville):				
Magnesium Alloy Corp. (http://www.magnesiumalloy.ca/)	Koulii region	58,000	Electrolytic, carnallite	2004
Canada:				
Magnolia Metallurgy Inc. (http://www.norandamagnesium.com)	Asbestos, Quebec	63,000	Electrolytic, asbestos tailings	2000
Cassiar Magnesium Inc. (http://www.cassiarmagnesium.com/)	Prince Rupert, British Columbia	90,000	Electrolytic, asbestos tailings	2003
GeoTech Surveys Inc. (Canadian Magnesium Corp.)	Baie Verte, Newfoundland	NA	NA, asbestos tailings	NA
Gossan Resources Ltd. (http://www.escape.ca/~gossan/index.phtml)	90 km N. of Winnipeg	50,000	Silicothermic, dolomite	NA
Netherlands:				
Antheus Magnesium Development Programme Delfzijl (http://www.antheus.nl/antheus_engels.html)	Eemsmond region	40,000- 50,000	Electrolytic, brines	NA
United Arab Emirates:				
Spectrum Technology Corp.	NA	NA	NA, seawater	NA

NA Not available.

In addition to the companies listed above, Bass Resources NL, Pilbara Magnesium Metal Associates NL, and Hazelwood Power have shown interest in developing new magnesium

resources and constructing magnesium metal plants in Australia, but the specific projects have not been delineated.

TABLE 1
U.S. IMPORTS FOR CONSUMPTION AND EXPORTS OF MAGNESIUM 1/

(Metric tons)

	2001			
	2000	January	February	January- February
Imports:				
Metal	22,900	2,140	1,800	3,950
Waste and scrap	9,890	805	1,010	1,810
Alloys (magnesium content)	56,300	4,240	2,750	6,990
Sheet, tubing, ribbons, wire, powder, and other (magnesium content)	2,300	242	214	456
Total	91,400	7,430	5,770	13,200
Exports:				
Metal	7,300	255	493	748
Waste and scrap	6,400	487	626	1,110
Alloys (gross weight)	6,020	290	173	463
Sheet, tubing, ribbons, wire, powder, and other (gross weight)	4,060	226	461	687
Total	23,800	1,260	1,750	3,010

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

Source: U.S. Census Bureau.