MAGNESIUM METAL[1]

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: In 2004, magnesium was produced by one company in Utah by an electrolytic process that recovered magnesium from brines from the Great Salt Lake. The leading use for magnesium, which accounted for 43% of apparent consumption, was as a constituent of aluminum-base alloys that were used for packaging, transportation, and other applications. Structural uses of magnesium (castings and wrought products) accounted for 38% of domestic metal use. Desulfurization of iron and steel accounted for 16% of U.S. consumption of primary metal, and other uses were 3%.

Salient Statistics—United States:	2000	2001	2002	2003	2004[e]
Production:					
Primary	W	W	W	W	W
Secondary (new and old scrap)	82	66	74	70	70
Imports for consumption	91	69	88	83	90
Exports	24	20	25	20	15
Consumption:					
Reported, primary	104	96	102	102	100
Apparent[2]	160	120	110	120	110
Price, yearend:					
Metals Week, U.S. spot Western, dollars per pound, average	1.27	1.25	1.16	1.14	1.75
Metal Bulletin, European free market, dollars per metric ton, average	2,000	1,825	1,930	1,900	2,000
Stocks, producer and consumer, yearend	W	W	W	W	W
Employment, number[e]	700	400	400	400	400
Net import reliance[3] as a percentage of apparent consumption	43	44	55	53	68

Recycling: In 2004, about 25,000 tons of the secondary production was recovered from old scrap.

Import Sources (2000-03): Canada, 43%; Russia, 19%; China, 17%; Israel, 9%; and other, 12%.

Tariff: Item	Number	Normal Trade Relations 12-31-04
Unwrought metal	8104.11.0000	8.0% ad val.
Unwrought alloys	8104.19.0000	6.5% ad val.
Wrought metal	8104.90.0000	14.8¢/kg on Mg content + 3.5% ad val.

Depletion Allowance: Dolomite, 14% (Domestic and foreign); magnesium chloride (from brine wells), 5% (Domestic and foreign).

Government Stockpile: None.

Events, Trends, and Issues: On February 27, the U.S. magnesium producer filed a petition with the U.S. International Trade Commission (ITC) claiming that imports of alloy magnesium from China and pure and alloy magnesium from Russia were harming the U.S. industry. After a hearing on March 19, the U.S. Department of Commerce, International Trade Administration (ITA) began an investigation into the claims. Although some magnesium from China was already subject to antidumping duties, this investigation included material not included in the first sets of antidumping duties. In 1995, the ITC had determined that imports of pure magnesium from China were injuring the U.S. magnesium industry, and set a duty rate of 108.26% ad valorem for pure magnesium, but no duty was established for alloy magnesium. After a new investigation begun in 2000, the ITC established a duty of 305.56% ad valorem as the China-wide rate (with one exception for a specific company) for granular magnesium, which was not covered by the 1995 determination. In both instances, magnesium from Russia had been investigated along with magnesium from China, but it was determined that imports of pure, alloy, and granular magnesium from Russia did not injure the U.S. industry, so no duty rates were established. In the new investigation, primary and secondary magnesium alloy, which would be classified under Harmonized Tariff Schedule (HTS) numbers 8104.19.00 and 8104.30.00 are the principal materials from China that are under investigation. For Russia, the investigation includes magnesium classified under HTS numbers 8104.11.00, 8104.19.00, 8104.30.00, and 8104.90.00. In September, the ITA announced preliminary antidumping duties for magnesium imports from China and Russia. It established a China-wide rate of 177.62% ad valorem, with slightly lower rates for three specific companies, and 10.62% ad valorem and 21.49% ad valorem for the two principal Russian magnesium producers. Final determinations were due in the first quarter of 2005.

Prepared by **Deborah A. Kramer [(703) 648-7719, dkramer@usgs.gov, fax: (703) 648-7975]**

MAGNESIUM METAL

In October, the U.S. magnesium producer announced that it would begin construction of a third set of electrolytic cells that would increase its capacity to 51,000 tons per year from the current level of 45,000 tons per year. The company would start bringing the new cells online in June 2005 and reach full capacity in 2006. The company planned an additional expansion to 73,000 tons per year if market conditions warrant.

Prices rose significantly in the first half of 2004. Increased costs for ferrosilicon and freight in China combined with electricity shortages drove prices up. By the end of May, the magnesium price in China had reached $2,300 per metric ton, its highest level ever since this price was first reported in 1999. As ferrosilicon prices began to fall, magnesium metal prices in China fell as well. European magnesium prices fell slightly in the third quarter, and U.S. and Chinese magnesium prices increased. Several factors contributed to the increase in U.S. prices: large aluminum producers began negotiating contracts for their 2005 magnesium needs, anticipation of a decision in the antidumping duty case on imports of magnesium from China and Russia, and the absence of low-cost Chinese magnesium in the U.S. market. Magnesium from China was sold mostly in Europe in the third quarter, and as a result, prices in Europe declined slightly.

Although construction of the proposed Queensland, Australia, magnesium plant was abandoned because of financial difficulties, some other proposed magnesium plants continued to move forward. In Australia, the proposed 100,000-ton-per-year magnesium-from-fly-ash plant was expected to be constructed within 5 years in Victoria, using Russian magnesium extraction technology, if funding is secured. Another Australian firm is investigating three sites—one each in Egypt, Qatar, and the United Arab Emirates—for a proposed 84,000-ton-per-year magnesium plant. In Congo (Brazzaville), development of a proposed 60,000-ton-per-year magnesium extraction plant continued; the plant was scheduled for completion in 2007. China continued to increase ingot and alloy production capacities at many of its plants.

World Primary Production, Reserves, and Reserve Base:

	Primary production		Reserves and reserve base[4]
	2003	2004[e]	
United States	W	W	Magnesium metal is derived from seawater, natural brines, dolomite, and other minerals. The reserves and reserve base for this metal are sufficient to supply current and future requirements. To a limited degree, the existing natural brines may be considered to be a renewable resource wherein any magnesium removed by humans may be renewed by nature in a short span of time.
Brazil	6	6	
Canada	60	60	
China	340	400	
Israel	34	34	
Kazakhstan	14	16	
Russia	52	55	
Serbia and Montenegro	2	2	
World total[5] (rounded)	508	570	

World Resources: Resources from which magnesium may be recovered range from large to virtually unlimited and are globally widespread. Resources of dolomite and magnesium-bearing evaporite minerals are enormous. Magnesium-bearing brines are estimated to constitute a resource in the billions of tons, and magnesium can be recovered from seawater at places along world coastlines.

Substitutes: Aluminum and zinc may substitute for magnesium in castings and wrought products. For iron and steel desulfurization, calcium carbide may be used instead of magnesium.

[e]Estimated. W Withheld to avoid disclosing company proprietary data.
[1]See also Magnesium Compounds.
[2]Rounded to two significant digits to protect proprietary data.
[3]Defined as imports – exports + adjustments for Government and industry stock changes.
[4]See Appendix C for definitions.
[5]Excludes the United States.