

MAGNESIUM METAL¹

(Data in thousand metric tons, unless noted)

Domestic Production and Use: Three companies in Texas, Utah, and Washington produced primary magnesium in 1995 valued at approximately \$460 million. An electrolytic process was used at plants in Texas and Utah to recover magnesium from seawater and lake brines, respectively. A thermic process was used to recover magnesium from dolomite in Washington. The aluminum industry remained the largest consumer of magnesium, accounting for 55% of domestic primary metal use. Magnesium was a constituent in aluminum-base alloys that were used for packaging, transportation, and other applications. Castings and wrought magnesium products accounted for 20% of U.S. consumption of primary metal; desulfurization of iron and steel, 12%; reducing agent in nonferrous metals production, 6%; cathodic protection, 2%; and other uses, 5%.

Salient Statistics—United States:		1991	1992	1993	1994	1995^e
Production:	Primary	131	137	132	128	140
	Secondary	51	57	59	62	60
Imports for consumption		32	12	37	29	33
Exports		55	52	39	45	37
Consumption:	Reported, primary	92	94	101	112	110
	Apparent	134	142	148	149	167
Price:	Metals Week, U.S. spot Western, dollars per pound	1.43	1.50	1.46	1.63	2.10
	Metal Bulletin, free market, dollars per metric ton	NA	2,625	2,260	3,125	4,300
Stocks, producer and consumer, yearend		27	13	26	19	18
Employment ^e		1,650	1,450	1,400	1,400	1,400
Net import reliance ² as a percent of apparent consumption		E	E	E	E	E

Recycling: In 1995, about 30,000 tons of the secondary production was recovered from old scrap.

Import Sources (1991-94): Canada, 46%; Russia, 29%; Mexico, 6%; Ukraine, 6%; and other, 13%.

Tariff:	Item	Number	Most favored nation (MFN)	Canada 12/31/95	Mexico 12/31/95	Non-MFN³ 12/31/95
			12/31/95			
Unwrought metal	8104.11.0000		8.0% ad val.	2.4% ad val.	Free	100% ad val.
Unwrought alloys	8104.19.0000		6.5% ad val.	1.9% ad val.	3.9% ad val.	60.5% ad val.
Wrought metal	8104.90.0000		14.8¢/kg on Mg content + 3.5% ad val.	4.4¢/kg on Mg content + 1% ad val.	Free	88¢/kg on Mg content + 20.0% ad val.

Depletion Allowance: Dolomite, 14% (Domestic and Foreign); magnesium chloride, 5% (Domestic and Foreign).

Government Stockpile: None.

Events, Trends, and Issues: Reduced imports, particularly from Russia, and increased demand, primarily for diecastings, led to a tight supply of magnesium in the United States. Free market magnesium prices climbed sharply during the year to reach a high of \$4,450 per ton in mid-August. Prices stabilized after August, but did not begin to decline until October.

On April 26, the International Trade Commission (ITC) announced its determinations in the final antidumping investigations of magnesium imports from China, Russia, and Ukraine. The ITC determined that the United States magnesium industry was injured by imports of pure magnesium from these three countries, but it was not injured by imports of alloy magnesium. This decision confirms final duties announced by the Department of Commerce in March setting deposit rates as follows: for China, 108.26%; for Russia, 0% to 100.25%, depending on the importer and the producer; and for Ukraine, 79.87% to 104.27%, depending on the importer.

Several companies were planning additional magnesium production capacity around the world. A Canadian firm announced that it would construct a demonstration plant in Pointe Claire, Quebec, to start operation by early 1996. If the demonstration plant proves successful, the company planned to start construction of a 58,000-ton-per-year plant

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in 1997, with the first commercial metal production early in 2000. The company planned to recover magnesium from asbestos tailings using a combination of leaching, dehydration, and electrolysis. The Norwegian magnesium producer announced that it would increase magnesium production at both its plants in Norway and Canada so that they would be running at full capacity by the second half of 1995. Total annual capacity for the two plants is estimated to be about 88,000 tons. A regional firm announced that it had completed a prefeasibility study to construct a 25,000-ton-per-year primary magnesium plant in Iceland. The final feasibility study, which will be completed in September, will reflect the company's design to use inexpensive local geothermal energy for the plant. Cost of the plant was estimated at \$250 million, and construction would take 2 to 3 years.

The State Planning Commission of China announced ambitious plans to more than double its production in the next 2 years. The Minhe magnesium smelter in Qinghai Province was expected to double its capacity to about 6,500 tons per year by the end of 1995. A joint venture between Chinese and Japanese companies was scheduled to start production in September in Jiangsu Province with an annual capacity of 4,000 tons. China's Jilin Province planned to construct four magnesium plants with a total production capacity of 8,200 tons per year. The new plants were scheduled to start up in 1996. The Linjiang Government also planned two plants with a total capacity of 6,000 tons per year. Several other city and provincial governments were seeking foreign investment to build new magnesium facilities.

A U.S. magnesium desulfurization reagent producer opened a new magnesium granule plant in Walkerton, IN, at the end of June. The new plant replaced two older plants in two other Indiana cities. Production capacity for magnesium granules from secondary magnesium remained essentially unchanged at 5,400 tons per year, but capacity for preblended desulfurization reagent doubled to 43,500 tons per year. The projected capacity for a new Indiana magnesium scrap refining plant was tripled to 32,000 tons per year. The plant was originally designed for a 10,000-ton-per-year capacity when it was announced in late 1994. Construction of the facility is slated to begin in early 1996, with initial start-up in late 1997. A total of 24,000 tons of capacity will be dedicated to high-purity secondary ingot, and 8,000 tons will be for magnesium chips for desulfurization. A domestic diecastings producer planned to build a new magnesium diecasting plant in Hannibal, MO. Initially the plant will operate two 1,200-ton cold chamber diecasting machines, but the company may triple the plant's capacity within 3 to 5 years.

World Primary Production, Reserves, and Reserve Base:

	Primary production		Reserves and reserve base⁴
	1994	1995^e	
United States	128	140	Domestic magnesium metal production is derived from natural brines and dolomite, and 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 a renewable resource wherein any magnesium removed by humans may be renewed by nature in a short span of time.
Brazil	10	10	
Canada	29	47	
China ^e	11	12	
France	9	10	
Japan	3	—	
Kazakstan ^e	15	15	
Norway	28	35	
Russia ^e	25	35	
Serbia and Montenegro	2	2	
Ukraine ^e	7	5	
World total	267	311	

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 billions of tons, and magnesium can be recovered from seawater at places along world coastlines where salinity is high.

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

^eEstimated. E Net exporter.

¹See also Magnesium Compounds.

²Defined as imports - exports + adjustments for Government and industry stock changes.

³See Appendix B.

⁴See Appendix C for definitions.