

## MAGNESIUM METAL<sup>1</sup>

(Data in thousand metric tons, unless otherwise noted)

**Domestic Production and Use:** Two companies in Utah and Washington produced primary magnesium in 2000. An electrolytic process was used at the plant in Utah to recover magnesium from lake brines, and a thermic process was used to recover magnesium from dolomite in Washington. Structural uses of magnesium (castings and wrought products) were the largest end use for magnesium, accounting for 45% of domestic primary metal use. Magnesium was a constituent of aluminum-base alloys that were used for packaging, transportation, and other applications, which accounted for 44% of total domestic consumption. Desulfurization of iron and steel accounted for 7% of U.S. consumption of primary metal; reducing agent in nonferrous metals production, 1%; and other uses, 3%.

<b>Salient Statistics—United States:</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000<sup>e</sup></b>
U.S. primary production capacity, yearend	145	145	145	80	83
Production: Primary	133	125	106	W	W
Secondary (new and old scrap)	71	78	76	87	90
Imports for consumption	47	65	83	91	90
Exports	41	41	35	29	20
Consumption: Reported, primary	102	100	103	131	130
Apparent	162	185	185	179	175
Price, yearend:					
Metals Week, U.S. spot Western, dollars per pound, average	1.75	1.65	1.57	1.48	1.35
Metal Bulletin, free market, dollars per metric ton, average	2,525	2,525	1,975	2,500	1,950
Stocks, producer and consumer, yearend	26	21	22	W	W
Employment, number <sup>e</sup>	1,400	1,400	800	800	800
Net import reliance <sup>2</sup> as a percent of apparent consumption	E	16	25	38	40

**Recycling:** In 2000, about 34,000 tons of the secondary production was recovered from old scrap.

**Import Sources (1996-99):** Canada, 47%; Russia, 21%; China, 15%; Israel, 8%; and other, 9%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations<sup>3</sup> 12/31/00</b>
	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:** At the request of one of the U.S. producers, the U.S. International Trade Commission (ITC) began an investigation regarding antidumping and countervailing duties on pure magnesium from China, Israel, and Russia. The following duties were finalized during 2000: countervailing for pure and alloy magnesium from Canada, 1.38% ad valorem for calendar year 1998, and the antidumping duty for pure magnesium from Canada for August 1, 1998, to July 31, 1999, at 0% ad valorem. The International Trade Administration also determined that because the largest Canadian producer had not sold commercial quantities of magnesium into the United States in a 3-consecutive-year period, it did not qualify for revocation of the antidumping duty. The ITC revoked the antidumping duty order established in 1995 on magnesium imported from Russia. After an investigation that began in June 1999, the European Commission recommended an antidumping duty on imports of magnesium from China of 63.4%; a significant increase from the 31.7% that is currently in effect.

A new plant in Quebec, Canada, that will produce magnesium from asbestos tailings is scheduled to begin commercial production in the first quarter of 2001. The Israeli magnesium producer is in the process of increasing production at its Sdom facility to 30,000 tons of magnesium metal and 24,000 tons of magnesium alloys in 2000, and the company is proceeding with the construction of its direct-chill caster for producing magnesium T-bar ingot. The 5,000-ton-per-year primary magnesium plant in Serbia, which had been shut down because of bombing in the area by North Atlantic Treaty Organization forces reportedly restarted production at the end of 1999. Although small quantities of magnesium were produced in 2000, it is uncertain whether commercial quantities of magnesium will be produced again. In China,

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several magnesium producers in the Shanxi Province have temporarily closed because of pollution problems; other Chinese magnesium producers, however, continued to expand production at some plants.

A preliminary feasibility study on the proposed magnesium plant in the Netherlands was completed. The study was for a combined 15,000-ton-per-year magnesium smelter, a diecasting plant, and a recycling plant. With the projected sale of excess chlorine generated at the plant, the operating cost for the plant is estimated to be about 60 cents per pound of magnesium. A decision on plant construction is expected by the end of 2001.

In March, a feasibility study on the construction of a new magnesium plant in Stanwell, Queensland, Australia, which estimates that the capital cost for a 96,000-ton-per-year plant would be \$759 million and that the operating cost would be between 58.1 and 63.8 cents per pound, was completed. A separate firm that plans to construct a magnesium plant in Australia began trial mining of its magnesite deposit in South Australia and selected Port Pirie as the site for its proposed 52,500-ton-per-year magnesium plant. Initial investment in the plant is expected to begin in 2001 with commercial production scheduled for 2004. A Canadian firm expects to complete a feasibility study on its planned 90,000-ton-per-year magnesium project by the end of 2000.

For the new 2001 models, North American auto manufacturers are expecting to average between 3.9 and 4.1 kilograms (8.5 and 9 pounds) of magnesium components per vehicle, a 12.5% increase from the 2000 average. Most of the increase will result from the use of existing part applications in new models. The principal magnesium components are instrument panel support beams, engine cam covers, four-wheel-drive transfer cases, steering column and pedal bracket supports, and steering wheel armatures.

The U.S. Environmental Protection Agency (EPA) is planning to collect information on sulfur hexafluoride (SF<sub>6</sub>) emissions from companies that produce or cast magnesium. The data collection is part of the EPA's SF<sub>6</sub> Emission Reduction Partnership for the Magnesium Industry, which is one of the agency's voluntary programs that contributes to the overall reduction of greenhouse gas emissions. SF<sub>6</sub> has a global warming potential of 23,900 times that of carbon dioxide, and although the principal source of SF<sub>6</sub> emissions is leaks in older electrical power transmission systems, SF<sub>6</sub> is also used as a cover gas when melting magnesium.

### World Primary Production, Reserves, and Reserve Base:

	Primary production		Reserves and reserve base <sup>4</sup>
	1999	2000 <sup>e</sup>	
United States	W	W	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 to be a renewable resource wherein any magnesium removed by humans may be renewed by nature in a short span of time.
Brazil	9	9	
Canada <sup>5</sup>	71	75	
China	<sup>e</sup> 83	80	
France	14	14	
Israel	25	25	
Kazakhstan	<sup>e</sup> 10	10	
Norway	28	30	
Russia	<sup>e</sup> 35	40	
Serbia and Montenegro	1	1	
Ukraine	<sup>e</sup> 1	—	
World total <sup>6</sup>	277	284	

**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 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.

<sup>e</sup>Estimated. E Net exporter. W Withheld to avoid disclosing company proprietary data.

<sup>1</sup>See also Magnesium Compounds.

<sup>2</sup>Defined as imports - exports + adjustments for Government and industry stock changes. Because of proprietary data constraints, stock changes are not included.

<sup>3</sup>No tariff for Canada and Israel for items shown.

<sup>4</sup>See Appendix C for definitions.

<sup>5</sup>Includes secondary.

<sup>6</sup>Excludes the United States.