

## MAGNESIUM COMPOUNDS<sup>1</sup>

(Data in thousand metric tons of magnesium content, unless otherwise noted)

**Domestic Production and Use:** Seawater and natural brines accounted for about 60% of U.S. magnesium compounds production. Magnesium oxide and other compounds were recovered from seawater by two companies in Delaware and Florida, from well brines by three companies in Michigan, and from lake brines by two companies in Utah. Magnesite was mined by one company in Nevada, brucite was mined by one company in Nevada and one company in Texas, and olivine was mined by two companies in North Carolina and Washington. About 65% of the magnesium compounds consumed in the United States was used for refractories. The remaining 35% was used in agricultural, chemical, construction, environmental, and industrial applications.

<b>Salient Statistics—United States:</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002<sup>e</sup></b>
Production	374	395	370	388	395
Imports for consumption	344	321	395	307	280
Exports	49	52	56	62	65
Consumption, apparent	669	664	709	634	610
Stocks, producer, yearend	NA	NA	NA	NA	NA
Employment, plant, number <sup>e</sup>	600	550	450	450	450
Net import reliance <sup>2</sup> as a percentage of apparent consumption	44	41	48	39	35

**Recycling:** Some magnesia-base refractories are recycled, either for reuse as refractory material or for use as construction aggregate.

**Import Sources (1998-2001):** China, 65%; Australia, 10%; Canada, 9%; Israel, 3%; and other, 13%.

<b>Tariff:<sup>3</sup> Item</b>	<b>Number</b>	<b>Normal Trade Relations 12/31/02</b>
Crude magnesite	2519.10.0000	Free.
Dead-burned and fused magnesia	2519.90.1000	Free.
Caustic-calcined magnesia	2519.90.2000	Free.
Kieserite	2530.20.1000	Free.
Epsom salts	2530.20.2000	Free.
Magnesium hydroxide	2816.10.0000	3.1% ad val.
Magnesium chloride	2827.31.0000	1.5% ad val.
Magnesium sulfate (synthetic)	2833.21.0000	3.7% ad val.

**Depletion Allowance:** Brucite, 10% (Domestic and foreign); dolomite, magnesite, and magnesium carbonate, 14% (Domestic and foreign); magnesium chloride (from brine wells), 5% (Domestic and foreign); and olivine, 22% (Domestic) and 14% (Foreign).

**Government Stockpile:** None.

## MAGNESIUM COMPOUNDS

**Events, Trends, and Issues:** Consumption of magnesia in refractory applications continued to decline in 2002, mainly because U.S. steel production declined. Although the drop in U.S. steel production from 2001 to 2002 was not as great as that in the previous year, steel production through July 2002 was 3.7% less than that in the first 7 months of 2002. One of the largest U.S. magnesia refractories manufacturers filed for chapter 11 bankruptcy in early 2002, although the company plans to reorganize and continue operating. Although the total quantity of magnesia imported from China declined, China remained the largest magnesia supplier to the United States.

The proposed 50,000-ton-per-year seawater magnesia plant in Western Australia, which was scheduled to be completed by 2004, was delayed because the magnesia market in Australia has not developed as quickly as expected. The magnesia was expected to be used as a neutralizing agent in the country's emerging lateritic nickel industry, but development of new lateritic nickel projects was behind schedule.

**World Mine Production, Reserves, and Reserve Base:** Reserves and reserve base estimates for Australia, China, and Slovakia have been revised based on new information from those countries.

	Magnesite production		Magnesite reserves and reserve base <sup>4</sup>	
	2001	2002 <sup>e</sup>	Reserves	Reserve base
United States	W	W	10,000	15,000
Australia	156	160	77,000	95,000
Austria	202	200	15,000	20,000
Brazil	81	80	45,000	65,000
China <sup>e</sup>	749	750	380,000	860,000
Greece	144	140	30,000	30,000
India	107	110	14,000	55,000
Korea, North <sup>e</sup>	288	290	450,000	750,000
Russia <sup>e</sup>	288	290	650,000	730,000
Slovakia <sup>e</sup>	288	100	41,000	319,000
Spain	156	150	10,000	30,000
Turkey	576	580	65,000	160,000
Other countries	132	130	390,000	440,000
World total (may be rounded)	<sup>5</sup> 3,170	<sup>5</sup> 2,980	2,100,000	3,600,000

In addition to magnesite, there are vast reserves of well and lake brines and seawater from which magnesium compounds can be recovered.

**World Resources:** Resources from which magnesium compounds can be recovered range from large to virtually unlimited and are globally widespread. Identified world resources of magnesite total 12 billion tons, and of brucite, several million tons. Resources of dolomite, forsterite, and magnesium-bearing evaporite minerals are enormous, and magnesia-bearing brines are estimated to constitute a resource in billions of tons. Magnesium hydroxide can be recovered from seawater.

**Substitutes:** Alumina, silica, and chromite substitute for magnesia in some refractory applications.

<sup>e</sup>Estimated. NA Not available. W Withheld to avoid disclosing company proprietary data.

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

<sup>2</sup>Defined as imports - exports + adjustments for Government and industry stock changes.

<sup>3</sup>Tariffs are based on gross weight.

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

<sup>5</sup>Excludes the United States.