

## 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 74% of U.S. magnesium compounds production. Magnesium oxide and other compounds were recovered from seawater by four companies in California, Delaware, Florida, and Texas; 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, and olivine was mined by two companies in North Carolina and Washington. About 62% of the magnesium compounds consumed in the United States was used for refractories. The remainder was consumed in agricultural, chemical, construction, environmental, and industrial applications.

<b>Salient Statistics—United States:</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998<sup>e</sup></b>
Production	345	360	389	402	440
Imports for consumption	287	328	240	259	220
Exports	46	54	66	56	50
Consumption, apparent	586	634	563	605	610
Stocks, producer, yearend	NA	NA	NA	NA	NA
Employment, plant, number <sup>e</sup>	650	600	600	600	600
Net import reliance <sup>2</sup> as a percent of apparent consumption	41	43	31	34	28

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

**Import Sources (1994-97):** China, 69%; Canada, 9%; Austria, 5%; Greece, 3%; and other, 14%.

<b>Tariff:<sup>3</sup> Item</b>	<b>Number</b>	<b>Normal Trade Relations (NTR)</b>	<b>Canada</b>	<b>Non-NTR<sup>4</sup></b>
		<b>12/31/98</b>	<b>12/31/98</b>	<b>12/31/98</b>
Crude magnesite	2519.10.0000	Free	Free	\$10.33/ton.
Dead-burned and fused magnesia	2519.90.1000	0.1¢/kg	Free	1.7¢/kg.
Caustic-calcined magnesia	2519.90.2000	41¢/ton	Free	\$20.70/ton.

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

**Government Stockpile:** None.

## MAGNESIUM COMPOUNDS

**Events, Trends, and Issues:** Because of the decline in imports of dead-burned magnesia from China, total U.S. production of magnesium compounds increased to meet the demand. Export licensing requirements for China reduced the maximum quantity of magnesia that the country could export to 1 million tons in 1998, one-half of the 1997 export volume of 2 million tons. In addition, U.S. production of magnesium hydroxide is expected to continue to increase because of the growing demand for the material in water treatment applications.

In the United States, a new operation was expected to open by yearend in Arizona to recover brucite from a deposit near Kingman. Brucite produced from the deposit will be targeted to flame retardant and smoke suppressant applications. One of the Michigan brine producers announced that it would double capacity for magnesium oxide and magnesium hydroxide at its Manistee facility by the end of 1999. Magnesium oxide produced at the facility is used by the rubber and plastics industry, and the magnesium hydroxide is used in pharmaceuticals.

In Australia, a new magnesite mine is planned to be developed in Tasmania by yearend 1999. In its initial stages of operation, crude magnesite from the mine is expected to be sold on as feed material for dead-burned and caustic-calcined magnesia throughout the Pacific Rim. The operating company is investigating the potential of using the magnesite as feed for a magnesium metal plant to be constructed near the mine. A contract to construct a magnesia plant in Jordan was scheduled to be awarded by yearend. The new plant will have an annual capacity of 50,000 tons of magnesia and 10,000 tons of specialty products; brine from the Dead Sea will be the plant's feed material. Completion is scheduled by mid-2000.

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

	Magnesite production		Magnesite reserves and reserve base <sup>5</sup>	
	1997	1998 <sup>e</sup>	Reserves	Reserve base
United States	W	W	10,000	15,000
Australia	71	75	NA	NA
Austria	187	190	15,000	20,000
Brazil	87	90	45,000	65,000
China <sup>e</sup>	576	580	750,000	1,000,000
Greece	187	190	30,000	30,000
India	108	100	30,000	45,000
Korea, North <sup>e</sup>	461	460	450,000	750,000
Russia <sup>e</sup>	173	170	650,000	730,000
Serbia and Montenegro	27	25	5,000	10,000
Slovakia <sup>e</sup>	288	290	20,000	30,000
Spain	130	130	10,000	30,000
Turkey	634	635	65,000	160,000
Other countries	99	100	420,000	480,000
World total (rounded)	<sup>6</sup> 3,030	<sup>6</sup> 3,040	2,500,000	3,400,000

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 B.

<sup>5</sup>See Appendix D for definitions.

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