

## 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 68% 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 69% 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>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996<sup>e</sup></b>
Production	418	386	345	360	450
Imports for consumption	179	256	287	328	250
Exports	49	52	46	54	60
Consumption, apparent	548	590	586	634	640
Stocks, producer, yearend	NA	NA	NA	NA	NA
Employment, plant <sup>e</sup> , number	650	650	650	600	600
Net import reliance <sup>2</sup> as a percent of apparent consumption	24	35	41	43	30

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

**Import Sources (1992-95):** China, 69%; Canada, 10%; Austria, 4%; Mexico, 3%; Greece, 3%; and other, 11%.

<b>Tariff:<sup>3</sup></b>	<b>Item</b>	<b>Number</b>	<b>Most favored nation (MFN) 12/31/96</b>	<b>Canada 12/31/96</b>	<b>Non-MFN<sup>4</sup> 12/31/96</b>
	Crude magnesite	2519.10.0000	Free	Free	\$10.33/ton.
	Dead-burned and fused magnesia	2519.90.1000	0.2¢/kg	Free	1.7¢/kg.
	Caustic-calcined magnesia	2519.90.2000	\$1.24/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.

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**Events, Trends, and Issues:** Several U.S. magnesium compounds producers announced capacity increases in 1996. One producer began operating a 15,000-ton-per-year magnesium hydroxide plant in Lenoir City, TN, in the third quarter using magnesite from China as a feed material. This company also operates a similar 30,000-ton-per-year magnesium hydroxide facility near Pittsburgh, PA, and the largest magnesia/magnesium hydroxide production plant in Michigan. This company's primary business is aerospace and defense, so the firm announced that it would sell its 81% interest in its aggregates and magnesia operations to concentrate on its core business. The sole magnesite producer in Nevada plans to install additional mining equipment to double its magnesite mining capabilities. A dead-burned magnesia producer in Michigan is installing a shaft kiln and upgrading other plant equipment to increase its annual production capacity from 160,000 tons to 200,000 tons. The United States is increasing production capacity at a time when imports of Chinese magnesia are decreasing, mostly because of the Chinese export licensing system. Reports of dead-burned magnesia smuggling from China have surfaced as a result of the imposition of these licensing fees.

In Europe, two companies, one in France and one in Germany, ceased production of fused magnesia, decreasing the total world capacity by 25,000 tons per year. Increases in capacity by a producer in the United Kingdom would add back 12,000 tons of annual capacity by the end of 1996. Total world capacity was estimated to be about 45,000 tons per year before the closures.

One of the Australian magnesia producers planned to construct a 25,000-ton-per-year magnesium hydroxide plant near Melbourne to supply environmental applications. Full production at the plant was scheduled for the end of 1996. If domestic and export markets grow as expected, the company plans to construct a second magnesium hydroxide plant near Sydney. The other Australian magnesia producer announced plans to sell its magnesia subsidiary and concentrate on its gold mining business.

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

	Magnesite production		Magnesite reserves and reserve base <sup>5</sup>	
	1995	1996 <sup>e</sup>	Reserves	Reserve base
United States	W	W	10,000	15,000
Australia	81	90	NA	NA
Austria	202	200	15,000	20,000
Brazil	81	80	45,000	65,000
China <sup>e</sup>	346	340	750,000	1,000,000
Greece	58	55	30,000	30,000
India	115	120	30,000	45,000
Korea, North <sup>e</sup>	461	460	450,000	750,000
Russia <sup>e</sup>	202	200	650,000	730,000
Serbia and Montenegro	22	20	5,000	10,000
Slovakia <sup>e</sup>	346	340	20,000	30,000
Spain	115	100	10,000	30,000
Turkey	519	520	65,000	160,000
Other countries	95	100	420,000	480,000
World total (may be rounded)	<sup>6</sup> 2,640	<sup>6</sup> 2,630	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 C for definitions.

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