

## 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 54% of U.S. magnesium compounds production in 2009. Magnesium oxide and other compounds were recovered from seawater by three companies in California, Delaware, and Florida; from well brines by one company 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 52% of the magnesium compounds consumed in the United States was used for refractories. The remaining 48% was used in agricultural, chemical, construction, environmental, and industrial applications.

<b>Salient Statistics—United States:</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009<sup>e</sup></b>
Production	301	282	342	274	255
Imports for consumption	391	371	357	342	110
Exports	31	28	26	25	13
Consumption, apparent	661	624	673	591	352
Stocks, producer, yearend	NA	NA	NA	NA	NA
Employment, plant, number <sup>e</sup>	370	370	370	370	300
Net import reliance <sup>2</sup> as a percentage of apparent consumption	54	55	49	54	28

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

**Import Sources (2005-08):** China, 79%; Austria, 5%; Canada, 4%; Australia, 2%; and other, 10%.

<b>Tariff:<sup>3</sup> Item</b>	<b>Number</b>	<b>Normal Trade Relations 12-31-09</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.

**Events, Trends, and Issues:** U.S. magnesia consumption fell significantly in 2009 because of a steep decline in U.S. steel production, the principal consuming industry for magnesia. Through the first 9 months of 2009, U.S. steel production was 47% lower than production in the corresponding period of 2008. As a result of lower steel production, U.S. imports, which have supplied the bulk of U.S. magnesium consumption, also declined. Through the first 7 months of 2009, imports of caustic-calcined magnesia were 40% lower than those in the same period of 2008, and imports of dead-burned magnesia were 85% lower than those in the first 7 months of 2008. An 88% decline in imports of dead-burned magnesia from China primarily was responsible for the decrease in total imports. Because of reduced demand, China canceled its export licenses for the second half of 2009. The original license quotas were scheduled to be for a total of 1.1 million tons, with 720,000 tons issued in the first half of the year; however, only 119,000 tons of magnesite was exported in the first 6 months of 2009.

After filing for bankruptcy in 2008, the Texas mine and processing plant of the sole brucite producer in the United States was for sale. In addition, one of the magnesium compounds producers in Michigan stopped producing magnesium compounds at its plant in Manistee at the beginning of 2009.

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The U.S. Department of Commerce, International Trade Administration, began an antidumping duty investigation of imports of magnesia-carbon bricks from China and Mexico and a countervailing duty investigation of imports of magnesia-carbon bricks from China.

Some proposed expansions in magnesia production capacity that had been announced, mostly in 2008, were postponed, most notably a 100,000-ton-per-year caustic-calcined magnesia expansion in Australia. These expansions initially were planned in response to reduced exports from China, particularly to the European Union and the United States. Despite sluggish global economic conditions, one firm in Saudi Arabia announced plans to build a 140,000-ton-per-year magnesite processing plant, although no timetable was determined. A new magnesite producer in Turkey was expected to have a 100,000-ton-per-year dead-burned magnesia plant onstream by the beginning of 2010 as well. In Brazil, a small seawater magnesia producer announced that it would double its production capacity to 12,000 tons per year by yearend 2010.

In July, the leading olivine producer in Norway, with a total mine capacity of 2.4 million metric tons per year, announced that it was temporarily suspending operations at two of its three mines because of reduced demand for olivine from the steel industry. Another olivine producer in Norway filed for bankruptcy in September citing reduced sales for the company's product. The company had been producing olivine only since 2004 at a 150,000-ton-per-year plant and had planned to expand capacity to 250,000 to 300,000 tons per year.

**World Magnesite Mine Production and Reserves:** Reserves data for Brazil, China, Slovakia, and Turkey were revised based on new information from the respective country Governments.

	Mine production		Reserves <sup>4</sup>
	2008	2009 <sup>e</sup>	
United States	W	W	10,000
Australia	130	130	100,000
Austria	230	200	15,000
Brazil	115	100	99,000
China	2,880	2,800	400,000
Greece	101	100	30,000
India	101	100	14,000
Korea, North	346	50	450,000
Russia	346	350	650,000
Slovakia	274	270	36,000
Spain	133	130	10,000
Turkey	605	600	49,000
Other countries	165	160	390,000
World total (rounded)	<sup>5</sup> 5,430	<sup>5</sup> 4,990	2,300,000

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, magnesium-bearing evaporite minerals, and magnesia-bearing brines are estimated to constitute a resource in billions of tons. Magnesium hydroxide can be recovered from seawater.

**Substitutes:** Alumina, chromite, and silica 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. Reserve base estimates were discontinued in 2009; see [Introduction](#).

<sup>5</sup>Excludes U.S. production.