

MAGNESIUM COMPOUNDS¹

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

Domestic Production and Use: Seawater and natural brines accounted for about 55% of U.S. magnesium compounds production in 2012. Magnesium oxide and other compounds were recovered from seawater by two companies in California and Delaware; 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 one company in Washington. About 55% of the magnesium compounds consumed in the United States was used for refractories. The remaining 45% was used in agricultural, chemical, construction, environmental, and industrial applications.

Salient Statistics—United States:	2008	2009	2010	2011	2012^e
Production	274	239	261	306	300
Imports for consumption	342	173	279	316	270
Exports	25	13	16	20	17
Consumption, apparent	591	399	524	602	553
Stocks, producer, yearend	NA	NA	NA	NA	NA
Employment, plant, number ^e	370	300	300	300	275
Net import reliance ² as a percentage of apparent consumption	54	40	50	49	46

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

Import Sources (2008–11): China, 64%; Canada, 7%; Brazil, 7%; Australia, 6%; and other, 16%.

Tariff:³ Item	Number	Normal Trade Relations 12–31–12
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: The sole U.S. magnesite producer, which also owned a seawater magnesia plant in Florida, closed the Florida operation in 2011 leaving only two magnesia-from-seawater plants in the United States—one in California and one in Delaware. The Norwegian olivine producer that owned the olivine operation in North Carolina decided to close the mine and plant in North Carolina and a processing plant in Indiana and supply the United States market with olivine from its Norway operations.

A class-action lawsuit that a group of U.S. farmers filed in 2010 against a U.S. magnesia producer and two other firms alleging that the three companies agreed to control the price of magnesia used in animal feed and fertilizers was voluntarily dismissed by the plaintiffs in September.

An Austrian-based magnesia and refractories producer purchased the magnesia producer in Serbia to add to its worldwide operations. The Serbian firm restarted production of dead-burned magnesia in March 2011 after completing a 4-year modernization project and owns magnesite mines in Cacak and Zlatibor. The Austrian firm had purchased magnesia operations in Ireland and Norway in 2011 and installed a new 76,000-ton-per-year rotary kiln at its Turkey operations to increase dead-burned magnesia production capacity there to 216,000 tons per year.

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In the Netherlands, the magnesium chloride brine producer planned to increase its production capacity for dead-burned magnesia at Veendam by 40,000 tons per year to 200,000 tons per year by 2013. The company also was drilling a new well to provide additional magnesium chloride salt raw material for its expansion.

Russia's leading magnesite producer completed construction of a crushing plant in Siberia as part of development of magnesite mines in the area. The company also began furnace construction for the 100,000-ton-per-year magnesia plant. When completed, the plant will have the capacity to produce 200,000 tons per year of calcined magnesia and 150,000 tons per year of fused magnesia. In January, a Greek magnesia producer completed installation of a new rotary kiln at its subsidiary in Turkey, which would double the caustic-calcined magnesia production capacity to 32,000 tons per year there.

Several firms were installing fused magnesia production capacity because dead-burned magnesia was being replaced with fused magnesia in some steel furnaces. Fused magnesia has superior properties to dead-burned magnesia in some refractory applications, including a higher magnesia content, a higher density, and a larger crystal size. New production capacity also provides consumers with an alternative to fused magnesia produced in China. In Norway, one of the leading refractory manufacturers was installing 80,000 tons per year of fused magnesia capacity at its brine magnesia plant, which was scheduled to be operational by yearend 2012. The leading magnesia producer in Turkey added 35,000 tons per year of fused magnesia capacity for a total of 52,000 tons per year; this also was expected to be operational by yearend 2012. In Russia, the leading magnesia producer doubled its fused magnesia capacity to 100,000 tons per year by yearend. The leading magnesia producer in Iran announced that it would complete a 5,000-ton-per-year fused magnesia plant by early 2013.

World Magnesite Mine Production and Reserves: Reserve data for Brazil, China, Greece, and India were revised based on new information from these Governments.

	Mine production		Reserves ⁴
	2011	2012 ^e	
United States	W	W	10,000
Australia	86	90	95,000
Austria	219	220	15,000
Brazil	140	140	86,000
China	4,180	4,300	500,000
Greece	86	90	80,000
India	101	100	20,000
Korea, North	43	45	450,000
Russia	346	350	650,000
Slovakia	172	180	35,000
Spain	133	130	10,000
Turkey	288	300	49,000
Other countries	135	150	390,000
World total (rounded)	⁵ 5,930	⁵ 6,100	2,400,000

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, 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.

^eEstimated. NA Not available. W Withheld to avoid disclosing company proprietary data.

¹See also Magnesium Metal.

²Defined as imports – exports + adjustments for Government and industry stock changes.

³Tariffs are based on gross weight.

⁴See Appendix C for resource/reserve definitions and information concerning data sources.

⁵Excludes U.S. production.