

MAGNESIUM METAL¹

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: In 2013, magnesium was produced by one company at a 63,500-ton-per-year plant in Utah by an electrolytic process that recovered magnesium from brines from the Great Salt Lake. The leading domestic use for primary magnesium was as a reducing agent for the production of titanium and other metals, accounting for 34% of primary metal use. Use as a constituent of aluminum-base alloys that were used for packaging, transportation, and other applications accounted for 33% of primary magnesium consumption. Structural uses of magnesium (castings and wrought products) accounted for 18% of primary metal consumption, desulfurization of iron and steel, 11%, and other uses, 4%.

Salient Statistics—United States:	2009	2010	2011	2012	2013^e
Production:					
Primary	W	W	W	W	W
Secondary (new and old scrap)	69	72	67	77	80
Imports for consumption	47	53	48	47	45
Exports	20	15	12	17	18
Consumption:					
Reported, primary	53	57	81	72	75
Apparent	² 80	² 100	³ 110	³ 110	³ 110
Price, yearend:					
U.S. spot Western, dollars per pound, average	2.30	2.43	2.13	2.20	2.13
China free market, dollars per metric ton, average	2,950	2,925	3,025	3,170	2,590
Stocks, producer and consumer, yearend	W	W	W	W	W
Employment, number ^e	400	400	400	420	420
Net import reliance ⁴ as a percentage of apparent consumption	33	38	33	27	25

Recycling: In 2013, about 25,000 tons of secondary magnesium was recovered from old scrap and 55,000 tons were recovered from new scrap.

Import Sources (2009–12): Israel, 33%; Canada, 25%; China, 8%; and other, 34%.

Tariff: Item	Number	Normal Trade Relations 12–31–13
Unwrought metal	8104.11.0000	8.0% ad val.
Unwrought alloys	8104.19.0000	6.5% ad val.
Wrought metal	8104.90.0000	14.8¢/kg on Mg content + 3.5% ad val.

Depletion Allowance: Dolomite, 14% (Domestic and foreign); magnesium chloride (from brine wells), 5% (Domestic and foreign).

Government Stockpile: None.

Events, Trends, and Issues: At the end of 2012, the U.S. Court of International Trade (CIT) reinstated an antidumping duty of 15.77% ad valorem assessed on magnesium metal imported into the United States from Russia by a specific company during the period of April 1, 2006, through March 31, 2007. In the original ruling, the 15.77% rate had been imposed, but following a company appeal, the CIT lowered the rate to 8.51% ad valorem. That ruling, however, was appealed to the U.S. Court of Appeals for the Federal Circuit, which ordered the CIT to reinstate the 15.77% rate. On January 1, 2013, the Government of China removed a 10% export tax on magnesium ingot and alloys. Following a complaint filed in 2011 by the European Union, Mexico, and the United States with the World Trade Organization (WTO), the WTO ruled that the export taxes on magnesium and other mineral products from China violated international trade agreements. In June, the U.S. Department of Commerce, International Trade Administration, imposed an antidumping duty of 339.60% ad valorem on imports of pure magnesium between May 1, 2011, and April 30, 2012, from China by a specific company and its affiliate.

According to the China Non-Ferrous Metals Industry Association, China's reported magnesium production was 478,000 tons in the first half of 2013, 26% higher than that in the first half of 2012. Capacity expansion continued in areas adjacent to sources of dolomite or lake brines and coking operations. Although much of the newer capacity is in locations with lower costs, such as Shaanxi Province, older capacity was still producing at reduced rates and could increase output if prices supported it.

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The use of magnesium in automobile parts was expected to continue to increase as automobile manufactures seek to decrease vehicle weight to comply with fuel efficiency standards. A South Korean producer of primary magnesium was developing magnesium automobile seat frames and was constructing a rolling mill to produce magnesium plate for use in the automobile industry. Consumption of magnesium in the production of titanium metal by the Kroll process was expected to increase as the use of titanium increases in aerospace applications.

In September 2013, the U.S. Department of Energy's (DOE) Advanced Research Projects Agency-Energy announced funding for a project to develop a method of recovering magnesium from seawater using less energy than current production methods. The 3-year project would be conducted at DOE's Pacific Northwest National Laboratory in Richland, WA, and cost \$2.7 million. Two corporate partners were also participating in the research project.

World Primary Production and Reserves:

	Primary production		Reserves ⁵
	2012	2013 ^e	
United States	W	W	Magnesium metal is derived from seawater, natural brines, dolomite, and other minerals. The reserves for this metal are sufficient to supply current and future requirements. To a limited degree, natural brines may be considered to be a renewable resource wherein any magnesium removed by humans may be renewed by nature in a short span of time.
Brazil	16	16	
China	698	800	
Israel	27	28	
Kazakhstan	21	21	
Korea, Republic of	3	9	
Malaysia	5	5	
Russia	29	30	
Serbia	2	2	
Ukraine	2	2	
World total ⁶ (rounded)	802	910	

World Resources: Resources from which magnesium may be recovered range from large to virtually unlimited and are globally widespread. Resources of dolomite and magnesium-bearing evaporite minerals are enormous. Magnesium-bearing brines are estimated to constitute a resource in the billions of tons, and magnesium could be recovered from seawater along world coastlines.

Substitutes: Aluminum and zinc may substitute for magnesium in castings and wrought products. For iron and steel desulfurization, calcium carbide may be used instead of magnesium.

^eEstimated. W Withheld to avoid disclosing company proprietary data.

¹See also Magnesium Compounds.

²Rounded to one significant digit to protect proprietary data.

³Rounded to two significant digits to protect proprietary data.

⁴Defined as imports – exports + adjustments for Government and industry stock changes.

⁵[See Appendix C for resource/reserve definitions and information concerning data sources.](#)

⁶Excludes U.S. production.