

## MAGNESIUM METAL<sup>1</sup>

(Data in thousand metric tons unless otherwise noted)

**Domestic Production and Use:** In 2010, magnesium was produced by one company at a plant in Utah by an electrolytic process that recovered magnesium from brines from the Great Salt Lake. Magnesium used as a constituent of aluminum-based alloys that were used for packaging, transportation, and other applications was the leading use for primary magnesium, accounting for 41% of primary metal use. Structural uses of magnesium (castings and wrought products) accounted for 32% of primary metal consumption. Desulfurization of iron and steel accounted for 13% of U.S. consumption of primary metal, and other uses were 14%.

<b>Salient Statistics—United States:</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010<sup>e</sup></b>
Production:					
Primary	W	W	W	W	W
Secondary (new and old scrap)	82	84	84	67	70
Imports for consumption	75	72	83	47	50
Exports	12	15	14	20	16
Consumption:					
Reported, primary	78	72	65	51	55
Apparent	<sup>2</sup> 120	<sup>2</sup> 130	<sup>2</sup> 140	<sup>3</sup> 90	<sup>2</sup> 100
Price, yearend:					
Platts Metals Week, U.S. spot Western, dollars per pound, average	1.40	2.25	3.15	2.30	2.60
Metal Bulletin, China free market, dollars per metric ton, average	2,050	4,550	2,800	2,740	3,100
Stocks, producer and consumer, yearend	W	W	W	W	W
Employment, number <sup>e</sup>	400	400	400	400	400
Net import reliance <sup>4</sup> as a percentage of apparent consumption	53	47	50	33	34

**Recycling:** In 2010, about 20,000 tons of secondary production was recovered from old scrap.

**Import Sources (2006–09):** Canada, 36%; Israel, 25%; China, 11%; Russia, 8%; and other, 20%.

<b>Tariff: Item</b>	<b>Number</b>	<b>Normal Trade Relations 12-31-10</b>
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:** In October, the U.S. Department of Commerce, International Trade Administration (ITA), made a final determination of antidumping duties for imports of pure magnesium from China into the United States for May 1, 2008, through April 30, 2009. The ITA determined a duty of 0% ad valorem for one company and a China-wide duty of 111.73% ad valorem, the same as the China-wide rate had been since the 2007–08 review. In its final review of primary magnesium shipments to the United States from Russia from April 1, 2008, through March 31, 2009, the ITA determined that the dumping rate for one of the two Russian primary magnesium producers was 0% ad valorem. For the other, even though the company did not sell material into the United States during the period of review, the ITA determined that if any material from the company had entered the United States through another firm, it would be subject to the “all others” rate of duty established at the time that it was imported into the United States. Normally, if a company had not made any sales into the U.S. market, the antidumping duty would be rescinded. The ITA also completed an expedited 5-year sunset review of magnesium alloy imports from China and pure and alloy magnesium imports from Russia into the United States. Because no party in the original determination notified the ITA that it intended to participate in the reviews, the ITA determined that revocation of the antidumping orders would likely lead to a continuation of dumping. As a result, the ITA maintained the antidumping duty orders. For alloy magnesium from China, two companies had a duty of 49.66% ad valorem, and the China-wide duty was 141.49% ad valorem. For pure and alloy magnesium from Russia, one primary magnesium-producing firm had a duty of 21.71% ad valorem, the other had a duty of 18.65% ad valorem, and the Russia-wide rate was 21.01% ad valorem.

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U.S. magnesium consumption increased in 2010 from the low level in 2009 as end-use markets that had been significantly affected by the global economic downturn began to recover slightly. Magnesium prices rose slightly in the United States because of tight supplies resulting from the antidumping duties assessed on magnesium imports from China and Russia. The duties also led to imports that were lower than historic levels, with Israel accounting for 62% of the total of U.S. imports of metal and alloy through the first 8 months of 2010. Magnesium supplies in the United States also were affected as a new titanium sponge plant in Rowley, UT, which began operating at the end of 2009, ramped up to full production. Significant quantities of magnesium used for titanium tetrachloride reduction were required for the initial startup period; the magnesium was supplied by the nearby U.S. producer.

In June, the U.S. Environmental Protection Agency (EPA) issued a final rule that requires annual greenhouse gas (GHG) emissions reporting from four source categories—one of which was magnesium production. Each facility must report total annual emissions for each of the following cover or carrier gases—sulfur hexafluoride, hydrofluorocarbon HFC-134a, the fluorinated ketone FK 5-1-12, carbon dioxide, and any other fluorinated GHG as defined in the rule. Collection of the data was scheduled to begin on January 1, 2011, with the first report due on March 31, 2012.

In a ruling by the 10th Circuit Court of Appeals, a 2007 decision exempting the U.S. primary magnesium producer's waste streams from regulation by the EPA under the Resource Conservation and Recovery Act (RCRA) was thrown out. In the lawsuit originally begun in 2001, the company argued that the EPA exempted five wastes from regulation under subtitle C of RCRA and that the EPA could not change that interpretation, at least not without first complying with the notice and comment procedures of the Administrative Procedure Act. The district court had agreed with the company, but, according to the new appellate court ruling, because the EPA never previously adopted a definitive interpretation, it remained free to change its mind and issue a new interpretation of its own regulations. The appellate court remanded the decision to the district court.

The first production of magnesium from a new primary magnesium plant in Malaysia began in June, although the plant had not ramped up to commercial-scale production. The facility in Taiping in the state of Perak used locally mined dolomite feedstock for a Pidgeon-process plant using natural gas to fuel the process. The initial production capacity was 15,000 tons per year. The company planned to double the capacity in the future and to begin producing magnesium alloys.

### **World Primary Production and Reserves:**

	Primary production		Reserves <sup>5</sup>
	2009	2010 <sup>e</sup>	
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, the existing 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	501	650	
Israel	29	30	
Kazakhstan	21	20	
Russia	37	40	
Serbia	2	2	
Ukraine	2	2	
World total <sup>6</sup> (rounded)	608	760	

**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 can be recovered from seawater at places 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.

<sup>e</sup>Estimated. W Withheld to avoid disclosing company proprietary data.

<sup>1</sup>See also Magnesium Compounds.

<sup>2</sup>Rounded to two significant digits to protect proprietary data.

<sup>3</sup>Rounded to one significant digit to protect proprietary data.

<sup>4</sup>Defined as imports – exports + adjustments for Government and industry stock changes.

<sup>5</sup>See Appendix C for resource/reserve definitions and information concerning data sources.

<sup>6</sup>Excludes U.S. production.