

MAGNESIUM METAL¹

(Data in thousand metric tons unless otherwise noted)

Domestic Production and Use: In 2011, 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 43% of primary metal use. Structural uses of magnesium (castings and wrought products) accounted for 40% of primary metal consumption. Desulfurization of iron and steel accounted for 11% of U.S. consumption of primary metal, and other uses were 6%.

| <u>Salient Statistics—United States:</u> | <u>2007</u> | <u>2008</u> | <u>2009</u> | <u>2010</u> | <u>2011^e</u> |
|---|--------------------|--------------------|--------------------|--------------------|--------------------------------|
| Production: | | | | | |
| Primary | W | W | W | W | W |
| Secondary (new and old scrap) | 89 | 88 | 67 | 72 | 75 |
| Imports for consumption | 72 | 83 | 47 | 53 | 50 |
| Exports | 15 | 14 | 20 | 15 | 12 |
| Consumption: | | | | | |
| Reported, primary | 72 | 65 | 51 | 56 | 60 |
| Apparent | ² 130 | ² 140 | ³ 90 | ² 110 | ² 110 |
| Price, yearend: | | | | | |
| U.S. spot Western, dollars per pound, average | 2.25 | 3.15 | 2.30 | 2.43 | 2.35 |
| China free market, dollars per metric ton, average | 4,550 | 2,665 | 2,950 | 2,925 | 3,300 |
| Stocks, producer and consumer, yearend | W | W | W | W | W |
| Employment, number ^e | 400 | 400 | 400 | 400 | 400 |
| Net import reliance ⁴ as a percentage of apparent consumption | 47 | 50 | 33 | 36 | 35 |

Recycling: In 2011, about 21,000 tons of secondary production was recovered from old scrap.

Import Sources (2007–10): Israel, 30%; Canada, 28%; China, 12%; and other, 30%.

| <u>Tariff:</u> | <u>Item</u> | <u>Number</u> | <u>Normal Trade Relations</u> |
|-----------------------|--------------------|----------------------|---------------------------------------|
| | | | <u>12-31-11</u> |
| | 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: After hearing arguments from U.S. magnesium diecasters, which claimed that their magnesium diecasting volumes were being reduced as a direct result of the antidumping duties on magnesium from China and Russia, and from the U.S. primary magnesium producer, the U.S. International Trade Commission (ITC) voted to retain antidumping duties on magnesium alloy from China and revoke antidumping duties on magnesium alloy imported from Russia. These votes resulted from a full sunset review of duties on magnesium alloy imports from China and Russia that were established in 2005. The U.S. primary magnesium producer appealed the decision to revoke the antidumping duties on Russian magnesium alloy because the company claimed that the ITC should have investigated the cumulative effects of the imports of magnesium from China and Russia, instead of assessing each country's imports separately. In October, the ITC scheduled an expedited 5-year sunset review on magnesium metal imports from China.

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The U.S. primary magnesium producer accelerated its expansion plans and expected to have most of an 11,500-ton-per-year expansion at its Rowley, UT, primary magnesium plant onstream by the end of 2011. The expansion was originally scheduled to be completed by yearend 2012, but the company cited an increase in orders as the reason for the accelerated startup. When the expansion is completed, the company's total production capacity would be 63,500 tons per year. Much of the magnesium production from the additional capacity would be sent to a nearby titanium sponge plant for use in its sponge production process.

In China, many companies continued to expand their primary magnesium metal production capacities. A South Korean steel producer announced that it would begin construction of a 10,000-ton-per-year primary magnesium plant in Gangneung City, Gangwon Province, Republic of Korea, in May 2011. Construction of the modified Pidgeon process plant was expected to be completed by June 2012. The Israeli primary magnesium producer announced that it would increase production at its magnesium plant in Sdom by as much as 10% through debottlenecking. The plant had the capacity to produce 34,000 tons per year of magnesium, and the company said that the increased production level should be reached in the first quarter of 2011. Most of the additional output was expected to be shipped to the United States.

In July, the World Trade Organization (WTO) issued its report concerning allegations by the European Union, Mexico, and the United States regarding export restraints maintained by China on various metals and minerals, including magnesium. A panel had been convened by the WTO in 2009 in response to the allegations. The panel found that the export duties and export quotas that China maintained on various forms of magnesium constituted a breach of WTO rules and that China failed to justify those measures as legitimate conservation measures, environmental protection measures, or short supply measures. The panel also found that China's imposition of minimum export price, export licensing, and export quota administration requirements on these materials, as well as China's failure to publish certain measures related to these requirements, was inconsistent with WTO rules.

In January, the U.S. Circuit Court of Appeals for the District of Columbia denied the U.S. magnesium producer's appeal of the U.S. Environmental Protection Agency's (EPA) decision to include the company's Rowley magnesium production facility as a Superfund site. The designation of the facility as a Superfund site gives the EPA the authority to investigate the site further to determine if a cleanup is necessary. The designated site encompasses 1,830 hectares on the southwest edge of the Great Salt Lake. Contaminants at the site include acidic wastewater, dioxins, furans, heavy metals, hexachlorobenzene, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons. By yearend, the EPA began its initial investigation to determine the extent of the cleanup.

World Primary Production and Reserves:

| | Primary production | | Reserves ⁵ |
|------------------------------------|--------------------|-------------------|---|
| | 2010 | 2011 ^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, 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 | 654 | 670 | |
| Israel | 25 | 28 | |
| Kazakhstan | 21 | 20 | |
| Russia | 37 | 37 | |
| Serbia | 2 | 2 | |
| Ukraine | 2 | 2 | |
| World total ⁶ (rounded) | 757 | 780 | |

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.

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

¹See also Magnesium Compounds.

²Rounded to two significant digits to protect proprietary data.

³Rounded to one significant digit to protect proprietary data.

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

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

⁶Excludes U.S. production.