

MOLYBDENUM

(Data in metric tons of molybdenum content unless otherwise noted)

Domestic Production and Use: In 2013, molybdenum, valued at about \$1.4 billion (based on an average oxide price), was produced at 11 mines. Molybdenum ore was produced as a primary product at three mines—two in Colorado, and one in Idaho—whereas eight copper mines (four in Arizona, one each in Montana, Nevada, New Mexico, and Utah) recovered molybdenum as a byproduct. Three roasting plants converted molybdenite concentrate to molybdic oxide, from which intermediate products, such as ferromolybdenum, metal powder, and various chemicals, were produced. Iron and steel and superalloy producers accounted for about 72% of the molybdenum consumed.

Salient Statistics—United States:	2009	2010	2011	2012	2013^e
Production, mine	47,800	59,400	63,700	60,400	61,000
Imports for consumption	11,400	19,700	21,100	19,800	18,500
Exports	27,900	31,600	35,400	29,300	39,400
Consumption:					
Reported ¹	17,700	19,200	19,100	19,700	20,100
Apparent ²	30,600	46,400	47,400	51,500	40,000
Price, average value, dollars per kilogram ³	25.84	34.83	34.34	28.09	22.74
Stocks, consumer materials	1,540	1,630	1,810	1,780	1,800
Employment, mine and plant, number	920	940	940	940	960
Net import reliance ⁴ as a percentage of apparent consumption	E	E	E	E	E

Recycling: Molybdenum in the form of molybdenum metal or superalloys was recovered, but the amount was small. Although molybdenum is not recovered from scrap steel, recycling of steel alloys is significant, and some molybdenum content is reutilized. The amount of molybdenum recycled as part of new and old steel and other scrap may be as much as 30% of the apparent supply of molybdenum.

Import Sources (2009–12): Ferromolybdenum: Chile, 78%; Canada, 8%; United Kingdom, 6%; and other, 8%. Molybdenum ores and concentrates: Mexico, 33%; Chile, 24%; Peru, 23%; Canada, 16%; and other, 4%.

Tariff: Item	Number	Normal Trade Relations 12–31–13
Molybdenum ore and concentrates, roasted	2613.10.0000	12.8¢/kg + 1.8% ad val.
Molybdenum ore and concentrates, other	2613.90.0000	17.8¢/kg.
Molybdenum chemicals:		
Molybdenum oxides and hydroxides	2825.70.0000	3.2% ad val.
Molybdates of ammonium	2841.70.1000	4.3% ad val.
Molybdates, all others	2841.70.5000	3.7% ad val.
Molybdenum pigments, molybdenum orange	3206.20.0020	3.7% ad val.
Ferrous alloys, ferromolybdenum	7202.70.0000	4.5% ad val.
Molybdenum metals:		
Powders	8102.10.0000	9.1¢/kg + 1.2% ad val.
Unwrought	8102.94.0000	13.9¢/kg + 1.9% ad val.
Wrought bars and rods	8102.95.3000	6.6% ad val.
Wrought plates, sheets, strips, etc.	8102.95.6000	6.6% ad val.
Wire	8102.96.0000	4.4% ad val.
Waste and scrap	8102.97.0000	Free.
Other	8102.99.0000	3.7% ad val.

Depletion Allowance: 22% (Domestic); 14% (Foreign).

Government Stockpile: None.

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Events, Trends, and Issues: U.S. mine output of molybdenum in concentrate in 2013 increased slightly from that of 2012. U.S. imports for consumption increased by 7% from those of 2012, and U.S. exports increased by 34% from those of 2012. Domestic roasters operated close to full production levels in 2012 and 2013. Reported U.S. consumption of primary molybdenum products slightly decreased from that of 2012. Apparent consumption of roasted molybdenum concentrates decreased by 22% from that of 2012. This decrease in apparent consumption is partially attributed to a 41% increase in exports of roasted molybdenum concentrates in 2013 compared with 2012.

Molybdenum prices continued to decrease throughout the year; the average price for 2013 was lower than that of 2012 as well as that of 2009. However, molybdenum demand remained strong. Byproduct and primary molybdenum production levels in the United States remained stable in 2013 compared with their relatively low levels in 2009. Primary molybdenum production continued at the Climax Mine in Lake County and Summit County, CO, but ceased at the Ashdown Mine in Humboldt County, NV, and at the Questa Mine in Taos County, NM. Byproduct molybdenum production at the Mission Mine in Pima County, AZ, continued to be suspended.

World Mine Production and Reserves: Reserve data from Turkey were revised based on new information from company reports.

	Mine production		Reserves ⁵ (thousand metric tons)
	2012	2013 ^e	
United States	60,400	61,000	2,700
Armenia	4,900	6,500	150
Canada	9,010	9,000	220
Chile	35,100	36,500	2,300
China	104,000	110,000	4,300
Iran	6,300	6,300	50
Kazakhstan	—	—	130
Kyrgyzstan	NA	NA	100
Mexico	11,000	11,000	130
Mongolia	1,900	2,000	160
Peru	16,800	16,900	450
Russia ^e	3,900	4,800	250
Turkey	5,000	5,000	100
Uzbekistan ^e	550	550	60
World total (rounded)	259,000	270,000	11,000

World Resources: Identified resources of molybdenum in the United States are about 5.4 million tons, and in the rest of the world, about 14 million tons. Molybdenum occurs as the principal metal sulfide in large low-grade porphyry molybdenum deposits and as an associated metal sulfide in low-grade porphyry copper deposits. Resources of molybdenum are adequate to supply world needs for the foreseeable future.

Substitutes: There is little substitution for molybdenum in its major application as an alloying element in steels and cast irons. In fact, because of the availability and versatility of molybdenum, industry has sought to develop new materials that benefit from the alloying properties of the metal. Potential substitutes for molybdenum include boron, chromium, niobium (columbium), and vanadium in alloy steels; tungsten in tool steels; graphite, tantalum, and tungsten for refractory materials in high-temperature electric furnaces; and cadmium-red, chrome-orange, and organic-orange pigments for molybdenum orange.

^eEstimated. E Net exporter. NA Not available.

¹Reported consumption of primary molybdenum products.

²Apparent consumption of molybdenum concentrates roasted to make molybdenum oxide.

³Time-weighted average price per kilogram of molybdenum contained in technical-grade molybdic oxide, as reported by Ryan's Notes.

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

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