

MOLYBDENUM

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

Domestic Production and Use: In 2010, molybdenum, valued at about \$885 million (based on average oxide price), was produced by eight mines. Molybdenum ore was produced as a primary product at three mines—one each in Colorado, Idaho, and Nevada—whereas five copper mines (three in Arizona, one each in Montana 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 75% of the molybdenum consumed.

Salient Statistics—United States:	2006	2007	2008	2009	2010^e
Production, mine	59,800	57,000	55,900	47,800	56,000
Imports for consumption	16,700	18,300	14,500	11,400	19,000
Exports	34,500	33,700	34,700	27,900	28,000
Consumption:					
Reported	19,000	21,000	21,100	18,100	18,000
Apparent	44,400	40,900	36,400	30,500	48,000
Price, average value, dollars per kilogram ¹	54.62	66.79	62.99	25.84	15.80
Stocks, mine and plant concentrates, product, and consumer materials	7,000	7,600	7,000	7,700	6,900
Employment, mine and plant, number	910	940	940	920	940
Net import reliance ² 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 (2006–09): Ferromolybdenum: Chile, 48%; China, 36%; Canada, 9%; and other, 7%. Molybdenum ores and concentrates: Chile, 30%; Mexico, 30%; Canada, 22%; Peru, 17%; and other, 1%.

Tariff: Item	Number	Normal Trade Relations 12-31-10
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.
Ferroalloys, 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 2010 increased about 17% from that of 2009. U.S. imports for consumption increased 67% from those of 2009, while U.S. exports increased slightly from those of 2009. Domestic roasters operated at between 80% and 90% of full production capacity in 2009, but in 2010 operated close to full production levels. U.S. reported consumption decreased slightly from that of 2009 while apparent consumption increased 57%. Mine capacity utilization in 2009 was about 82%.

Molybdenum prices increased in the first half of 2010 but slowly started to decrease in the third quarter; however, molybdenum demand remained strong. Both byproduct and primary molybdenum production levels in the United States recovered in 2010 from their relatively low levels in 2009. The Henderson Mine in Empire, CO, increased molybdenum production by almost 50% in 2010 from that in 2009. Byproduct molybdenum production continued to be suspended at the Chino Mine in Grant County, NM, the Morenci Mine in Greenlee County, AZ, and the Mission Mine in Pima County, AZ. The Questa Mine, in Taos County, NM, suspended its primary molybdenum mine production as well.

World Mine Production and Reserves: Reserves for Canada, China, Mexico, Mongolia, Peru, and Russia were revised based on new information published in mining companies' annual reports.

	Mine production		Reserves ³ (thousand metric tons)
	2009	2010 ^e	
United States	47,800	56,000	2,700
Armenia	4,150	4,200	200
Canada	8,840	9,100	200
Chile	34,900	39,000	1,100
China	93,500	94,000	4,300
Iran	3,700	3,700	50
Kazakhstan	380	400	130
Kyrgyzstan	250	250	100
Mexico	7,800	8,000	130
Mongolia	3,000	3,000	160
Peru	12,300	12,000	450
Russia ^e	3,800	3,800	250
Uzbekistan ^e	550	550	60
World total (rounded)	221,000	234,000	9,800

World Resources: Identified resources of molybdenum in the United States amount to 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 chromium, vanadium, niobium (columbium), and boron in alloy steels; tungsten in tool steels; graphite, tungsten, and tantalum for refractory materials in high-temperature electric furnaces; and chrome-orange, cadmium-red, and organic-orange pigments for molybdenum orange.

^eEstimated. E Net exporter.

¹Time-weighted average price per kilogram of molybdenum contained in technical-grade molybdic oxide, as reported by Platts Metals Week.

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

³See Appendix C for resource/reserve definitions and information concerning data sources.