MOLYBDENUM

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

<u>Domestic Production and Use</u>: In 2006, molybdenum, valued at about \$3.2 billion (based on average oxide price), was produced by nine mines. Molybdenum ore was produced as a primary product at three mines, one each in Colorado, Idaho, and New Mexico, whereas six copper mines (two 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 74% of the molybdenum consumed.

Salient Statistics—United States:	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u> 2005</u>	2006 ^e
Production, mine	32,300	33,500	41,500	58,000	60,500
Imports for consumption	11,500	11,900	17,300	20,700	17,300
Exports	23,700	21,900	34,500	41,400	33,500
Consumption:					
Reported	15,300	16,400	17,400	18,900	19,300
Apparent	20,700	26,200	24,100	35,400	44,500
Price, average value, dollars per kilogram ¹	8.27	11.75	36.73	70.68	53.10
Stocks, mine and plant concentrates,					
product, and consumer materials	10,000	7,200	7,500	9,400	9,250
Employment, mine and plant, number	489	510	630	880	910
Net import reliance ² as a percentage of					
apparent consumption	Е	Е	Е	Е	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.

<u>Import Sources (2002-05)</u>: Ferromolybdenum: China, 88%; United Kingdom, 4%; Chile 3%; and other, 5%. Molybdenum ores and concentrates: Canada, 36%; Chile, 30%; Mexico, 29%; and other, 5%.

Tariff: Item	Number	Normal Trade Relations 12-31-06
Molybdenum ore and concentrates, roasted	2613.10.0000	12.8¢/k g + 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.

MOLYBDENUM

Events, Trends, and Issues: U.S. mine output of molybdenum in concentrate in 2006 increased about 4% from that of 2005. U.S. imports for consumption decreased an estimated 16% from those of 2005, while the U.S. exports decreased about 19% from those of 2005. More molybdenum concentrates being processed into products in the United States reduced the need for imports to meet domestic demand as concentrates represent the largest import/export category. The decrease in exports reflects the return to full production levels of domestic roasters by the end of 2005 and an additional roaster being brought online at a plant in Langeloth, PA, in 2006. U.S. reported consumption increased 2% from that of 2005. Mine capacity utilization in 2006 was about 82%.

China's high level of steel production and consumption provided strong internal demand for molybdenum. Coupled with supply disruptions in the Huludao area of Laioning Province, this led to reduced Chinese exports in 2005 and 2006. Reduced Chinese exports and the continued roaster bottleneck in the west continued to support historically high molybdenum prices. Most byproduct and primary molybdenum mines maintained high production levels in 2006. High copper prices and a refined copper supply deficit allowed the Bagdad and Sierrita Mines in Arizona to maintain production at full capacity. The Bingham Canyon Mine near Salt Lake City, UT, which optimized its mill operation to maximize molybdenum recovery and more than doubled molybdenum production from 2004 to 2005, maintained high production levels in 2006. Production capacity at the Henderson Mine, Empire, CO, was expanded to about 18,100 metric tons per year of contained molybdenum in 2006. The Robinson Mine, near Ely, NV, restarted its molybdenum circuit in 2006.

World Mine Production, Reserves, and Reserve Base:

		Mine production		Reserve base ³	
	<u>2005</u>	2006 ^e	(thous	(thousand metric tons)	
United States	58,000	60,500	2,700	5,400	
Armenia	2,750	2,750	200	400	
Canada	7,910	8,460	450	910	
Chile	47,748	38,700	1,100	2,500	
China	40,000	41,000	3,300	8,300	
Iran	2,000	2,200	50	140	
Kazakhstan	230	400	130	200	
Kyrgyzstan	250	250	100	180	
Mexico	4,246	2,500	135	230	
Mongolia	1,188	1,200	30	50	
Peru	17,325	17,500	140	230	
Russia ^e	3,000	3,000	240	360	
Uzbekistan ^e	500	500	60	<u> 150</u>	
World total (rounded)	185,000	179,000	8,600	19,000	

<u>World Resources</u>: Identified resources amount to about 5.4 million tons of molybdenum in the United States and about 13 million tons in the rest of the world. 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.

<u>Substitutes</u>: 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, columbium (niobium), 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-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 definitions.