TUNGSTEN

(Data in metric tons of tungsten, unless otherwise noted)

Domestic Production and Use: In 1996, one mine in California produced tungsten concentrate. The mine operated at an annual rate well below capacity. End uses of tungsten included metalworking, mining, and construction machinery and equipment, 80%; electrical and electronic machinery and equipment and transportation, 9%; lamps and lighting, 8%; chemicals, 2%; and other, 1%. The total estimated value of primary tungsten materials consumed in 1996 was $400 million.

Salient Statistics—United States:	1992	1993	1994	1995	1996[e]
Production, mine shipments	W	W	W	W	W
Imports for consumption, concentrate	2,500	1,700	3,000	4,200	3,100
Exports, concentrate	38	63	44	10	32
Government stockpile shipments, concentrate	—	—	—	—	—
Consumption: Reported, concentrate	4,300	[1]2,900	[1]3,600	6,300	6,200
Apparent, all forms	7,100	7,100	10,900	14,000	15,100
Price, concentrate, dollars per mtu WO_3,[2] average:					
U.S. spot market, Metals Week	56	43	45	62	67
European market	58	35	42	64	55
Stocks, producer and consumer, yearend concentrate	750	640	800	675	680
Employment, mine and mill, number	47	33	20	20	20
Net import reliance[3] as a percent of apparent consumption	86	82	81	84	82

Recycling: During 1996, the quantity of scrap reprocessed into intermediates was about 2,700 tons, representing approximately 18% of apparent consumption of tungsten in all forms.

Import Sources (1992-95): China, 30%; Russia, 13%; Germany, 10%; Bolivia, 7%; and other, 40%.

Tariff: Item	Number	Most favored nation (MFN) 12/31/96	Non-MFN[4] 12/31/96
Ore	2611.00.3000	Free	$1.10/kg W cont.
Concentrate	2611.00.6000	37.5¢/kg W cont.	$1.10/kg W cont.
Ferrotungsten	7202.80.0000	5.6% ad val.	35.0% ad val.
Tungsten powders	8101.10.0000	9.1% ad val.	58.0% ad val.
Ammonium tungstate	2841.80.0010	8.2% ad val.	49.5% ad val.
Tungsten carbide	2849.90.3000	9.5% ad val.	55.5% ad val.

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

Government Stockpile: The inventory shown below includes the following quantities of nonstockpile-grade tungsten (tons): ore and concentrate, 10,060; ferrotungsten, 533; metal powder, 151; and carbide powder, 51.

	Stockpile Status—9-30-96			
Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposals Jan.-Sept. 96
Ore and concentrate	34,600	—	—	—
Metal powder	900	—	—	—
Ferrotungsten	900	—	—	—
Carbide powder	900	—	—	—

Events, Trends, and Issues: Apparent consumption of tungsten products increased by about 8% during 1996 compared with that of 1995, resulting from a slowing of the continued growth in the U.S. economy that began in late 1993. Demand for cemented carbide end-use products was particularly strong compared with that of 1995, whereas demand in most other end-use sectors decreased from that of the previous year. Demand for ferrotungsten, however, was about the same.

Availability of tungsten materials from China, the major supplier to the world market, became progressively more limited during 1996. Early in the year, China cut tungsten exports by 5% because of its reduced reserves and weak prices in

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the international markets. This was followed by a 1-month annual maintenance shutdown of China's major tungsten mines and ammonium paratungstate plants. By midyear, China had resumed production at approximately one-half of its major tungsten mines. However, most of its small-sized mines were closed owing to shortages of electrical supply.

During 1996, world market supply met demand not through an increase in mine production, but rather through major drawdown of stocks. At midyear, there was no active mining in the Commonwealth of Independent States (CIS), no CIS stock releases in the prior 2 months, and claims by China that no more of their stocks were available. In addition, Russian producers of tungsten concentrate had to operate with prolonged down times owing to low prices, thereby incurring debts. Hence, the future supply of tungsten is uncertain unless more mines are open and new deposits are utilized.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves[5]	Reserve base[5]
	1995	1996[e]		
United States	W	W	140,000	200,000
Australia	—	—	1,000	200,000
Austria	—	—	10,000	15,000
Bolivia	800	800	53,000	100,000
Brazil	100	100	20,000	20,000
Burma	500	500	15,000	34,000
Canada	—	—	260,000	490,000
China	21,000	20,000	940,000	1,300,000
France	—	—	20,000	20,000
Kazakstan	100	100	—	38,000
Korea, North	900	900	—	35,000
Korea, Republic of	—	—	58,000	77,000
Portugal	500	500	25,000	25,000
Russia	5,400	5,400	250,000	420,000
Tajikistan	100	75	—	23,000
Thailand	60	60	30,000	30,000
Turkmenistan	—	—	—	10,000
Uzbekistan	300	300	—	20,000
Other countries	1,000	1,000	280,000	360,000
World total (may be rounded)	31,000	30,000	2,100,000	3,300,000

World Resources: More than 90% of the world's estimated tungsten resources are outside the United States, with about 45% in China. In addition to China and the United States, countries with significant resources are Australia, Austria, Bolivia, Brazil, Burma, Canada, Kazakstan, North Korea, Republic of Korea, Peru, Portugal, Russia, Spain, Tajikistan, Thailand, Turkey, Turkmenistan, and Uzbekistan.

Substitutes: Cemented tungsten carbide remained a primary cutting-tool insert material because of its versatility in meeting technical requirements in many turning and milling operations. However, ceramics, ceramic-metallic composites, and other materials continued to be developed and utilized as substitutes to meet the changing needs of the world market. Increased quantities of carbide cutting-tool inserts were coated with nitrides, oxides, and carbides to extend the life of the inserts. Tungsten remained the preferred and essentially unsubstitutable material for filaments, electrodes, and contacts in lamp and lighting applications. An electrodeless, nontungsten lamp was introduced to the market for commercial and industrial use.

[e]Estimated. W Withheld to avoid disclosing company proprietary data.

[1]Excludes 3 months of withheld data.

[2]A metric ton unit (mtu) of tungsten trioxide (WO_3) contains 7.93 kilograms of tungsten.

[3]Defined as imports - exports + adjustments for Government and industry stock changes.

[4]See Appendix B.

[5]See Appendix C for definitions.