TUNGSTEN

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

Domestic Production and Use: The last recorded production of tungsten concentrates in the United States was in 1994. Approximately 10 companies in the United States processed tungsten concentrates, ammonium paratungstate, tungsten oxide, and/or scrap to make tungsten powder, tungsten carbide powder, and/or tungsten chemicals. Nearly 75 industrial consumers were surveyed on a monthly or annual basis. Based on data reported by these consumers, approximately 73% of the tungsten consumed in the United States went into making cemented carbide parts to be used as cutting and wear-resistant materials primarily in the metalworking, oil and gas drilling, mining, and construction industries. The remaining tungsten was consumed in making lamp filaments, electrodes, and other components for the electrical and electronics industries, 14%; steels, superalloys, and wear-resistant alloys, 12%; and chemicals for catalysts and pigments, 1%. The total estimated value of primary tungsten materials consumed in 1999 was $250 million.

Salient Statistics—United States:	1995	1996	1997	1998	1999e
Production, mine	—	—	—	—	—
Imports for consumption, concentrate	4,660	4,190	4,850	4,750	3,300
Exports, concentrate	20	72	40	49	200
Government stockpile shipments: Concentrate	—	—	—	—	1,300
Other forms	—	—	—	—	240
Consumption: Reported, concentrate	5,890	5,260	6,590	[1]3,210	W
Apparent, all forms	10,000	10,800	12,100	12,300	12,000
Price, concentrate, dollars per mtu WO_3,[2] average:					
U.S. spot market, Platt's Metals Week	62	66	64	52	47
European market, Metal Bulletin	64	53	47	44	40
Stocks, consumer, yearend concentrate	627	569	658	514	500
Employment, mine and mill, number	—	—	—	—	—
Net import reliance[3] as a percent of apparent consumption	90	89	84	77	81

Recycling: During 1999, the tungsten content of scrap consumed by processors and end users was estimated at 3,000 tons. This represented approximately 25% of apparent consumption of tungsten in all forms.

Import Sources (1995-98): Tungsten content of ores and concentrates, intermediate and primary products, wrought and unwrought tungsten, and waste and scrap: China, 35%; Russia, 23%; Bolivia, 5%; Germany, 5%; and other, 32%.

Tariff: Item	Number	Normal Trade Relations[4] 12/31/99
Ore	2611.00.3000	Free.
Concentrate	2611.00.6000	37.5¢/kg W cont.
Ferrotungsten	7202.80.0000	5.6% ad val.
Tungsten powders	8101.10.0000	7.0% ad val.
Ammonium tungstate	2841.80.0010	5.5% ad val.
Tungsten carbide	2849.90.3000	8.0% ad val.
Tungsten oxide	2825.90.3000	5.5% ad val.

Depletion Allowance: 23% (Domestic), 15% (Foreign).

Government Stockpile: In July, the U.S. Government began sales of tungsten ores and concentrates from the National Defense Stockpile for the first time since 1989. In September, sales of ferrotungsten, tungsten carbide powder, and tungsten metal powder were initiated. In addition to the data shown below, as of September 30, 1999, the stockpile contained 95 tons (tungsten content) of committed nonstockpile-grade ferrotungsten and the following quantities of uncommitted nonstockpile-grade tungsten materials (tons of tungsten content): ores and concentrates, 7,010; ferrotungsten, 437; metal powder, 151; and carbide powder, 51. During fiscal year 1999, 91 tons (tungsten content) of nonstockpile-grade ferrotungsten were disposed.

Prepared by **Kim B. Shedd [(703) 648-4974, kshedd@usgs.gov, fax: (703) 648-7757]**

TUNGSTEN

Stockpile Status—9-30-99[5]

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1999	Disposals FY 1999
Carbide powder	760	111	760	454	111
Ferrotungsten	385	—	385	136	—
Metal powder	674	36	674	68	36
Ores and concentrates	26,300	1,320	26,300	1,360	1,350

Events, Trends, and Issues: World tungsten supply continued to be dominated by Chinese production and exports. In an effort to control its output, the Chinese Government stopped issuing new permits for tungsten mines and reduced the number of export licenses for tungsten materials. To bring the prices of tungsten materials closer to the costs of production, the China Tungsten Industry Association established minimum prices for ammonium paratungstate, tungsten concentrates, and tungsten oxide. Following these actions, Metal Bulletin prices for ammonium paratungstate and tungsten concentrates steadily increased during the second half of 1999.

In July, the U.S. Government began selling tungsten materials from the National Defense Stockpile. In August, the U.S. Department of Commerce and U.S. International Trade Commission reviewed the antidumping duty order on tungsten ore concentrates from China, which had been in effect since 1991. As a result of the review, the order was revoked effective January 1, 2000.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves[6]	Reserve base[6]
	1998	1999[e]		
United States	—	—	140,000	200,000
Australia	—	—	1,000	63,000
Austria	1,400	1,400	10,000	15,000
Bolivia	497	250	53,000	100,000
Brazil	50	50	20,000	20,000
Burma	200	280	15,000	34,000
Canada	—	—	260,000	490,000
China	24,700	24,700	850,000	1,200,000
France	—	—	20,000	20,000
Kazakhstan	—	—	NA	38,000
Korea, North	900	900	NA	35,000
Korea, Republic of	—	—	58,000	77,000
Portugal	831	450	25,000	25,000
Russia	3,000	3,000	250,000	420,000
Tajikistan	—	—	NA	23,000
Thailand	20	20	30,000	30,000
Turkmenistan	—	—	NA	10,000
Uzbekistan	200	150	NA	20,000
Other countries	355	109	280,000	360,000
World total (rounded)	32,200	31,300	2,000,000	3,200,000

World Resources: More than 90% of the world's estimated tungsten resources is outside the United States. Nearly 40% of these resources is in China, 15% is in Canada, and 13% is in Russia.

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. However, an electrodeless, nontungsten lamp is available for commercial and industrial use.

[e]Estimated. NA Not available. W Withheld to avoid disclosing company proprietary data.
[1]Excludes 6 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]Special tariff rates apply for Canada and Mexico.
[5]See Appendix B for definitions.
[6]See Appendix C for definitions.