TUNGSTEN

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

Domestic Production and Use: The last recorded U.S. production of tungsten concentrates was in 1994. In 2001, approximately eight 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 70 industrial consumers were surveyed on a monthly or annual basis. Data reported by these consumers indicates that 65% of the tungsten consumed in the United States was used in cemented carbide parts for 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; steels, superalloys, and wear-resistant alloys; and chemicals for catalysts and pigments. The total estimated value of tungsten consumed in 2001 was $350 million.

Salient Statistics—United States:	1997	1998	1999	2000	2001e
Production:					
Mine	—	—	—	—	—
Secondary	2,930	3,350	4,980	5,120	6,000
Imports for consumption:					
Concentrate	4,850	4,750	2,870	2,370	2,400
Other forms	7,980	8,490	8,230	7,810	8,000
Exports:					
Concentrate	12	10	26	70	140
Other forms	2,570	3,640	2,860	2,800	5,000
Government stockpile shipments:					
Concentrate	—	—	(1)	1,240	1,700
Other forms	—	—	(1)	591	900
Consumption:					
Reported, concentrate	6,590	2 3,210	2 2,100	W	W
Apparent, all forms	12,200	12,300	12,900	14,300	14,000
Price, concentrate, dollars per mtu WO_3,[3] average:					
U.S. spot market, Platts Metals Week	64	52	47	47	64
European market, Metal Bulletin	47	44	40	45	66
Stocks, industry, yearend:					
Concentrate	658	514	W	W	W
Other forms	2,550	2,780	2,490	2,270	1,900
Net import reliance[4] as a percentage of apparent consumption	84	77	65	67	59

Recycling: During 2001, the tungsten content of scrap consumed by processors and end users was estimated at 6,000 tons. This represented approximately 43% of apparent consumption of tungsten in all forms.

Import Sources (1997-2000): Tungsten content of ores and concentrates, intermediate and primary products, wrought and unwrought tungsten, and waste and scrap: China, 41%; Russia, 21%; Germany, 5%; Portugal, 5%; and other, 28%.

Tariff: Item	Number	Normal Trade Relations[5] 12/31/01
Ore	2611.00.3000	Free.
Concentrate	9902.26.1100	Free.
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	7.0% ad val.
Tungsten oxide	2825.90.3000	5.5% ad val.

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

Government Stockpile: Sales of National Defense Stockpile tungsten began in 1999. In addition to the data listed in the table below, as of September 30, 2001, the stockpile also contained the following quantities of uncommitted nonstockpile-grade materials authorized for disposal (tons of tungsten content): ores and concentrates, 6,410; ferrotungsten, 342; and metal powder, 151.

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TUNGSTEN

Stockpile Status—9-30-01[6]

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2001	Disposals FY 2001
Carbide powder	—	151	—	454	377
Ferrotungsten	201	36	201	136	200
Metal powder	529	—	529	136	136
Ores and concentrates	23,700	1,980	23,700	1,810	1,870

Events, Trends, and Issues: World tungsten supply continued to be dominated by Chinese production and exports. Beginning in 1999 and continuing into 2001, the Chinese Government took several steps to control the release of Chinese tungsten into the world market and to increase prices. During the latter half of 2000, prices for ammonium paratungstate and tungsten concentrates began to rapidly increase. The Metal Bulletin price for tungsten concentrates leveled off in February 2001, and then began to decline in August. The Metal Bulletin European free market price for ammonium paratungstate increased until April 2001, leveled off, and then began to decline in June. Nevertheless, these relatively high prices, in combination with the desire by western processors to diversify the sources of their tungsten raw materials, resulted in renewed interest in increasing tungsten mine production outside China. Projects to increase production from operating mines, to restart production from closed mines, and to develop new mines were under consideration and development.

World Mine Production, Reserves, and Reserve Base:

	Mine production 2000	Mine production 2001[e]	Reserves[7]	Reserve base[7]
United States	—	—	140,000	200,000
Australia	—	—	7,000	79,000
Austria	1,600	1,700	10,000	15,000
Bolivia	381	390	53,000	100,000
Brazil	14	15	8,500	20,000
Burma	82	90	15,000	34,000
Canada	—	—	260,000	490,000
China	30,000	37,000	770,000	1,100,000
Korea, North	700	600	NA	35,000
Korea, Republic of	—	—	58,000	77,000
Portugal	750	800	25,000	25,000
Russia	3,500	3,600	250,000	420,000
Thailand	30	50	30,000	30,000
Uzbekistan	200	150	NA	20,000
Other countries	155	190	300,000	450,000
World total (rounded)	37,400	44,600	1,900,000	3,100,000

World Resources: Although world tungsten resources are geographically widespread, China has many deposits, including some of the largest in the world. As a result, China ranks number one in terms of tungsten resources and reserves. Canada, Kazakhstan, Russia, and the United States also have significant tungsten resources.

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 alumina, diamond, titanium carbide, and/or titanium nitride 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. — Zero.

[1]Less than ½ unit.

[2]Excludes 6 months of withheld data.

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

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

[5]Special tariff rates apply for Canada and Mexico.

[6]See Appendix B for definitions.

[7]See Appendix C for definitions.