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. In 2000, a California-based tungsten processor ceased operations. At yearend, approximately nine 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. Data reported by these consumers indicates that approximately 70% of the tungsten consumed in the United States went into making cemented carbide parts to be used as cutting and wearresistant 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, 17%; steels, superalloys, and wear-resistant alloys, 12%; and chemicals for catalysts and pigments, 1%. The total estimated value of tungsten consumed in 2000 was $300 million.

Salient Statistics—United States:	1996	1997	1998	1999	2000[e]
Production: Mine	—	—	—	—	—
Secondary	2,670	2,930	3,350	5,250	5,300
Imports for consumption: Concentrate	4,190	4,850	4,750	2,870	2,500
Other forms	7,580	7,980	8,490	8,230	7,800
Exports: Concentrate	18	12	10	26	60
Other forms	2,540	2,570	3,640	2,860	2,400
Government stockpile shipments: Concentrate	—	—	—		1,300
Other forms	—	—	—	(1)	700
Consumption: Reported, concentrate	5,260	6,590	[2]3,210	(1)	W
Apparent, all forms	10,900	12,200	12,300	13,200	14,700
Price, concentrate, dollars per mtu WO_3,[3] average:					
U.S. spot market, Platt's Metals Week	66	64	52	47	47
European market, Metal Bulletin	53	47	44	40	44
Stocks, industry, yearend: Concentrate	569	658	514	W	W
Other forms	W	2,550	2,780	2,520	2,290
Net import reliance[4] as a percent of apparent consumption	89	84	77	64	68

Recycling: During 2000, the tungsten content of scrap consumed by processors and end users was estimated at 5,300 tons. This represented approximately 36% of apparent consumption of tungsten in all forms.

Import Sources (1996-99): Tungsten content of ores and concentrates, intermediate and primary products, wrought and unwrought tungsten, and waste and scrap: China, 39%; Russia, 21%; Bolivia, 5%; Portugal, 5%; and other, 30%.

Tariff: Item	Number	Normal Trade Relations[5] 12/31/00
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	7.5% 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, 2000, the stockpile also contained the following quantities of uncommitted nonstockpile-grade materials authorized for disposal (tons of tungsten content): ores and concentrates, 7,010; ferrotungsten, 383; metal powder, 151; and carbide powder, 48.

TUNGSTEN

Stockpile Status—9-30-00[6]

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2000	Disposals FY 2000
Carbide powder	323	309	323	454	749
Ferrotungsten	309	123	309	136	142
Metal powder	606	—	606	68	67
Ores and concentrates	25,000	1,560	25,000	1,810	1,360

Events, Trends, and Issues: World tungsten supply continued to be dominated by Chinese production and exports. Beginning in 1999 and continuing into 2000, the Chinese Government took several steps to control the release of Chinese tungsten into the world market and to increase prices. By November 2000, prices quoted by Metal Bulletin for ammonium paratungstate and tungsten ore concentrates had increased significantly as compared with those of early 1999.

The absence of new mine development, declining production from operating mines, and closure of mines outside China continue to be concerns for tungsten consumers. In 1999, a new source of supply became available when the U.S. Government began selling tungsten materials from the National Defense Stockpile. By law, sales of materials from the stockpile must not result in undue disruption to the usual markets of producers, processors, and consumers of the materials; or avoidable loss to the United States.

World Mine Production, Reserves, and Reserve Base:

	Mine production 1999	Mine production 2000[e]	Reserves[7]	Reserve base[7]	
United States	1,000	—	—	140,000	200,000
Australia		—	—		63,000
Austria					15,000
Bolivia	1,610	1,600	10,000	Brazil	100,000
Burma		—	—		20,000
Canada					34,000
China					490,000
Korea, North					1,200,000
Korea, Republic of					35,000
Portugal					77,000
Russia					25,000
Thailand		—	—	53,000	420,000
Uzbekistan					30,000
Other countries		3		15,000	20,000
		3			450,000
World total (rounded)	20,000	24,000	820,000		3,200,000
		4			
		350			
			87	90	
		260,000	24,000		
	700	600	NA		
		58,000			
		450	750	25,000	
		3,500	3,700	250,000	
		29	30	30,000	
		200	150	NA	
		130	190	300,000	
		31,000	31,500	2,000,000	

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]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 for items shown. [6]See Appendix B for definitions.

[7]See Appendix C for definitions.