TUNGSTEN

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

Domestic Production and Use: In 1997, little if any tungsten concentrate was produced from U.S. mines. 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. More than 70 industrial consumers were surveyed on a monthly or annual basis. Based on data reported by these consumers, approximately 80% of 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, 7%; tool steels, 6%; other steels, superalloys, and wearresistant alloys, 6%; and chemicals for catalysts and pigments, 1%. The total estimated value of primary tungsten materials consumed in 1997 was $280 million.

Salient Statistics—United States:	1993	1994	1995	1996	1997[e]
Production, mine shipments	W	W	W	W	W
Imports for consumption, concentrate	1,720	2,960	4,660	4,190	4,700
Exports, concentrate	63	44	20	72	20
Government stockpile shipments, concentrate	—	—	—	—	—
Consumption: Reported, concentrate[1]	2,870	3,630[1]	6,320	5,420	7,100
Apparent, all forms	7,100	7,900	10,000	10,700	11,400
Price, concentrate, dollars per mtu WO average:[2]					
U S spot market Platt's Metals Week[3]	42	45	62	66	66
Stocks, producer and consumer, yearend concentrate	35	42	64	53	47
Employment, mine and mill, number[3]	636	955	675	613	600
Net import reliance as a percent of apparent consumption	33	35	46	58	60
	81	95	90	90	85

Recycling: During 1997, the quantity of scrap reprocessed into intermediates was about 2,400 tons, representing approximately 21% of apparent consumption of tungsten in all forms.

Import Sources (1993-96): China, 35%; Russia, 20%; Germany, 7%; Bolivia, 6%; and other, 32%.

Tariff: Item	Number	Most favored nation (MFN)[4] 12/31/97	Non-MFN[5] 12/31/97
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	8.4% ad val.	58.0% ad val.
Ammonium tungstate	2841.80.0010	7.3% ad val.	49.5% ad val.
Tungsten carbide	2849.90.3000	9.0% ad val.	55.5% ad val.

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

Government Stockpile: In addition to the data shown below, the stockpile contained the following quantities of nonstockpile-grade tungsten

Stockpile Status—9-30-97[6]

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1997	Disposals FY 1997
Carbide powder	871	—	—	—	—
Ferrotungsten	385	—	—	—	—
Metal powder	710	—	—	—	—
Ore and concentrate	27,600	—	—	—	—

materials (tons of tungsten content): ores and concentrates, 7,010; ferrotungsten, 533; metal powder, 151; and carbide powder, 51.

TUNGSTEN

Events, Trends, and Issues: World demand for tungsten was strong in 1997 and was expected to be higher than that of 1996. Continued exports of tungsten materials from China and Russia have sustained an oversupply situation, kept prices low, and resulted in a significant decrease in mine production. The amount of tungsten concentrates remaining in stockpiles in China and Former Soviet Union countries and how long they will continue to contribute to world supply are concerns for the tungsten industry. Once the stockpiles are depleted, world mine production will have to increase to meet demand. How quickly mines can be brought back on line and whether mine production can meet demand once stockpiles are depleted will influence the future tungsten supply/demand balance.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves	Reserve base
	1996	1997[e]		
Australia	1,000	—	140,000	210,000
Austria	—	—	1,000	1,000
Bolivia	360	360	53,000	63,000
Korea, North	580	580	10,000	15,000
Korea, Republic of	—	—	35,000	38,000
Portugal	—	—	1,000	1,000
Russia	58,000	1,340	25,000	77,000
Rwanda	—	—	1,000	1,000
Spain	100	100	330	330
United States	W	W	53,000	100,000
Other countries	20,000	20,000	20,000	20,000
World total (may be rounded)	24,000	24,000	15,000	34,000
Canada	220	220	260,000	490,000
China	900	900	920,000	1,300,000
France	20,000	20,000	20,000	20,000
Kazakstan	50	Turkmenistan	300	—
Thailand	300		20,000	
Uzbekistan	680		280,000	360,000
Other countries	32,000		2,100,000	3,300,000
World total (may be rounded)				

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

[6] 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] Special tariff rates apply for Canada and Mexico. [5] See Appendix B.
[6] See Appendix C for definitions. [7] See Appendix D for definitions.