

TUNGSTEN

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

Domestic Production and Use: The last reported U.S. production of tungsten concentrates was in 1994. In 2004, approximately seven 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. Approximately 65 industrial consumers were surveyed on a monthly or annual basis. Data reported by these consumers indicate that more than one-half of the tungsten consumed in the United States was used in cemented carbide parts for cutting and wear-resistant materials primarily in the metalworking, mining, oil- and gas-drilling, and construction industries. The remaining tungsten was consumed to make heavy metal alloys for applications requiring high density; electrodes, filaments, wires, and other components for electrical, electronic, heating, lighting, and welding applications; steels, superalloys, and wear-resistant alloys; and chemicals for various applications. The total estimated value of tungsten consumed in 2004 was \$200 million.

Salient Statistics—United States:	2000	2001	2002	2003	2004^e
Production:					
Mine	—	—	—	—	—
Secondary	5,210	5,390	4,380	4,110	3,600
Imports for consumption:					
Concentrate	2,370	2,680	4,090	4,690	2,200
Other forms	7,810	8,150	6,510	7,620	8,400
Exports:					
Concentrate	70	220	94	20	40
Other forms	2,800	4,860	3,220	5,070	4,300
Government stockpile shipments:					
Concentrate	1,240	2,200	1,140	710	979
Other forms	591	986	177	182	70
Consumption:					
Reported, concentrate	W	W	W	W	W
Apparent, ¹ all forms	14,400	14,500	11,900	10,100	11,800
Price, concentrate, dollars per mtu WO ₃ , ² average:					
U.S. spot market, Platts Metals Week	47	64	55	50	47
European market, Metal Bulletin	45	65	38	45	55
Stocks, industry, yearend:					
Concentrate	W	W	W	W	W
Other forms	2,280	2,110	1,610	1,830	1,900
Net import reliance ³ as a percentage of apparent consumption	66	64	69	63	73

Recycling: In 2004, the tungsten content of scrap consumed by processors and end users represented approximately 30% of apparent consumption of tungsten in all forms.

Import Sources (2000-03): Tungsten content of ores and concentrates, intermediate and primary products, wrought and unwrought tungsten, and waste and scrap: China, 47%; Canada, 18%; and other, 35%.

Tariff: Item	Number	Normal Trade Relations⁴ 12-31-04
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	5.5% 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. Included in the data listed in the following table, as of September 30, 2004, are 6,070 tons of tungsten contained in uncommitted nonstockpile-grade ores and concentrates authorized for disposal.

TUNGSTEN

Material	Stockpile Status—9-30-04 ⁵				
	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2004	Disposals FY 2004
Ferrotungsten	233	3	233	136	—
Metal powder	463	—	463	136	—
Ores and concentrates	28,400	—	28,400	1,810	312

Events, Trends, and Issues: World tungsten supply continued to be dominated by Chinese production and exports. Beginning in 1999 and continuing into 2004, the Chinese Government took several steps to control the release of Chinese tungsten into the world market. In addition to regulating production and the total volume of tungsten exports, the Government was gradually shifting the balance of export quotas towards value-added downstream tungsten materials and products. China was also becoming a large tungsten consumer. During the past decade, the growth in China's economy has resulted in a significant increase in consumption of tungsten materials to produce finished products for the domestic market, such as cemented carbide tools.

In late 2003, the sole Canadian tungsten mine suddenly suspended operations, and owners placed the mine on care-and-maintenance status after being notified by their two customers that they were terminating their purchase agreement and issuing a demand with respect to their loan obligation.

Health, safety, and environmental issues are becoming increasingly significant to metals such as tungsten. Several U.S. Government agencies were studying the health or environmental effects of exposure to various tungsten compounds. Cemented carbides were classified as carcinogens by three separate international organizations. The European Commission's new chemicals policy, if implemented as proposed, would affect all suppliers of tungsten materials to the European market by requiring them to collect and submit risk assessment data on each material produced in or imported into the European Union.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁶	Reserve base ⁶
	2003	2004 ^e		
United States	—	—	140,000	200,000
Austria	1,400	1,400	10,000	15,000
Bolivia	442	450	53,000	100,000
Canada	2,750	—	260,000	490,000
China	52,000	53,000	1,800,000	4,200,000
Korea, North	600	600	NA	35,000
Portugal	700	700	25,000	25,000
Russia	3,900	3,500	250,000	420,000
Other countries	290	300	360,000	700,000
World total (rounded)	62,100	60,000	2,900,000	6,200,000

World Resources: World tungsten resources are geographically widespread. China ranks number one in the world in terms of tungsten resources and reserves and has some of the largest deposits. 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 used as substitutes to meet the changing needs of the world market. Tungsten remained the preferred material for electrodes or filaments in fluorescent, gas discharge halogen, and incandescent lighting applications. Researchers recently developed a bulb that uses a carbon nanotube filament, however, and a nontungsten electrodeless lamp based on induction technology is available for commercial and industrial use. The use of light-emitting diodes (LEDs) in lighting applications is expected to increase. As LEDs substitute for traditional lighting technologies, the overall effect on tungsten consumption will depend on whether tungsten-copper heat sinks are used to dissipate heat from the LED devices. Depleted uranium is a substitute for tungsten alloys or tungsten carbide in armor-piercing projectiles.

^eEstimated. NA Not available. W Withheld to avoid disclosing company proprietary data. — Zero.

¹The sum of U.S. secondary production, as estimated from scrap consumption, and net import reliance.

²A metric ton unit (mtu) of tungsten trioxide (WO₃) contains 7.93 kilograms of tungsten.

³Defined as imports – exports + adjustments for Government and industry stock changes.

⁴Special tariff rates apply for Canada and Mexico.

⁵See [Appendix B](#) for definitions.

⁶See [Appendix C](#) for definitions.