

TUNGSTEN

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

Domestic Production and Use: A newly opened tungsten mine in northwest Utah produced concentrates in 2016; no tungsten concentrate was produced in California during the first 10 months of the year. Approximately seven companies in the United States processed tungsten concentrates, ammonium paratungstate, tungsten oxide, and (or) scrap to make tungsten metal powder, tungsten carbide powder, and (or) tungsten chemicals. Nearly 60% of the tungsten used in the United States was used in cemented carbide parts for cutting and wear-resistant applications, primarily in the construction, metalworking, mining, and oil and gas drilling industries. The remaining tungsten was used to make various alloys and specialty steels; electrodes, filaments, wires, and other components for electrical, electronic, heating, lighting, and welding applications; and chemicals for various applications. The estimated value of apparent consumption in 2016 was approximately \$500 million.

Salient Statistics—United States:	2012	2013	2014	2015	2016^e
Production:					
Mine	NA	NA	NA	NA	NA
Secondary	9,180	8,600	W	W	W
Imports for consumption:					
Concentrate	3,610	3,690	4,080	3,970	3,600
Other forms	8,070	8,460	8,820	6,270	5,800
Exports:					
Concentrate	186	1,050	1,230	398	100
Other forms	6,590	6,660	5,490	3,360	2,800
Government stockpile shipments:					
Concentrate	1,780	2,100	282	—	—
Other forms	(¹)	—	(¹)	—	—
Consumption:					
Reported, concentrate	W	W	W	W	W
Apparent, ^{2,3} all forms	14,900	14,600	W	W	W
Price, concentrate, dollars per mtu WO₃,⁴ average,					
U.S. spot market, Platts Metals Week	358	358	348	302	142
Stocks, industry, yearend, concentrate and other forms	W	W	W	W	W
Net import reliance⁵ as a percentage of					
apparent consumption	39	41	>25	>25	>25

Recycling: The estimated quantity of tungsten consumed from secondary sources by processors and end users in 2016 was withheld to avoid disclosing company proprietary data.

Import Sources (2012–15): Tungsten contained in ores and concentrates, intermediate and primary products, wrought and unwrought tungsten, and waste and scrap: China, 37%; Canada, 10%; Bolivia, 9%; Germany, 8%; and other, 36%.

Tariff: Item	Number	Normal Trade Relations⁶ 12–31–16
Ores	2611.00.3000	Free.
Concentrates	2611.00.6000	37.5¢/kg tungsten content.
Tungsten oxides	2825.90.3000	5.5% ad val.
Ammonium tungstates	2841.80.0010	5.5% ad val.
Tungsten carbides	2849.90.3000	5.5% ad val.
Ferrotungsten	7202.80.0000	5.6% ad val.
Tungsten powders	8101.10.0000	7.0% ad val.
Tungsten waste and scrap	8101.97.0000	2.8% ad val.

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

Government Stockpile:

Material	Stockpile Status—9–30–16⁷		
	Inventory	Disposal Plan FY 2016	Disposals FY 2016
Metal powder	125	35	—
Ores and concentrates	11,600	1,360	—

TUNGSTEN

Events, Trends, and Issues: World tungsten supply was dominated by production in China and exports from China. China was also the world's leading tungsten consumer. China's Government regulated its tungsten industry by limiting the number of mining and export licenses, imposing quotas on concentrate production, and placing constraints on mining and processing. In terms of tonnage, mine production outside China has steadily increased since 2010. In 2014, Vietnam became the second leading global producer of tungsten concentrates, new mine production began in the United Kingdom and Zimbabwe in 2015, and a tungsten operation in Spain began producing tungsten concentrates from mined ore in 2016.

An economic slowdown in China and weak economic conditions elsewhere ultimately led to tungsten supply (mine production plus recycled scrap) exceeding consumption. Global tungsten prices trended downward from mid-2013 through most of 2015. As a result of these and other factors, the sole tungsten mine in Canada in late 2015 suspended operations and was placed on care-and-maintenance status, eight large producers in China announced plans to reduce their output of tungsten concentrates, the China Tungsten Industry Association asked its members to cut their production of tungsten concentrates, and China's State Reserve Bureau held tenders to purchase tungsten concentrates. Tungsten prices began to trend upward in late 2015 through early 2016.

World Mine Production and Reserves: Reserves for Portugal, Russia, Vietnam, and "Other countries" were revised based on company or Government reports.

	Mine production		Reserves ⁸
	2015	2016 ^e	
United States	NA	NA	NA
Austria	861	860	10,000
Bolivia	1,460	1,400	NA
Canada	1,680	—	290,000
China	73,000	71,000	1,900,000
Portugal	474	570	2,700
Russia	2,600	2,600	83,000
Rwanda	850	770	NA
Spain	835	800	32,000
United Kingdom	150	700	51,000
Vietnam	5,600	6,000	95,000
Other countries	1,910	1,700	680,000
World total (rounded)	³ 89,400	³ 86,400	3,100,000

World Resources: World tungsten resources are geographically widespread. China ranks first 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: Potential substitutes for cemented tungsten carbides include cemented carbides based on molybdenum carbide and titanium carbide, ceramics, ceramic-metallic composites (cermets), and tool steels. Potential substitutes for other applications are as follows: molybdenum for certain tungsten mill products; molybdenum steels for tungsten steels; lighting based on carbon nanotube filaments, induction technology, and light-emitting diodes for lighting based on tungsten electrodes or filaments; depleted uranium or lead for tungsten or tungsten alloys in applications requiring high-density or the ability to shield radiation; and depleted uranium alloys or hardened steel for cemented tungsten carbides or tungsten alloys in armor-piercing projectiles. In some applications, substitution would result in increased cost or a loss in product performance.

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

¹Less than ½ unit.

²The sum of U.S. net import reliance (defined in footnote 5) and secondary production.

³Does not include U.S. mine production.

⁴A metric ton unit (mtu) of tungsten trioxide (WO₃) contains 7.93 kilograms of tungsten.

⁵Defined as imports – exports + adjustments for Government and industry stock changes.

⁶No tariff for Canada. Tariffs for other countries for some items may be eliminated under special trade agreements.

⁷See [Appendix B](#) for definitions.

⁸See [Appendix C](#) for resource and reserve definitions and information concerning data sources.