


TUNGSTEN

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

Domestic Production and Use: In 1996, one mine in California produced tungsten concentrate. The mine operated at an annual rate well below capacity. End uses of tungsten included metalworking, mining, and construction machinery and equipment, 80%; electrical and electronic machinery and equipment and transportation, 9%; lamps and lighting, 8%; chemicals, 2%; and other, 1%. The total estimated value of primary tungsten materials consumed in 1996 was \$400 million.

| Salient Statistics—United States: | Collected By  China Tungsten Online | | | | |
|---|---|-------------|-------------|-------------|-------------------------|
| | 1992 | 1993 | 1994 | 1995 | 1996^e |
| Production, mine shipments | W | W | W | W | W |
| Imports for consumption, concentrate | 2,500 | 1,700 | 3,000 | 4,200 | 3,100 |
| Exports, concentrate | 38 | 63 | 44 | 10 | 32 |
| Government stockpile shipments, concentrate | — | — | — | — | — |
| Consumption: Reported, concentrate | 4,300 | 2,900 | 3,600 | 6,300 | 6,200 |
| Apparent, all forms | 7,100 | 7,100 | 10,900 | 14,000 | 15,100 |
| Price, concentrate, dollars per mtu WO ₃ , ² average: | | | | | |
| U.S. spot market, Metals Week | 56 | 43 | 45 | 62 | 67 |
| European market | 58 | 35 | 42 | 64 | 55 |
| Stocks, producer and consumer, yearend concentrate | 750 | 640 | 800 | 675 | 680 |
| Employment, mine and mill, number | 47 | 33 | 20 | 20 | 20 |
| Net import reliance ³ as a percent of apparent consumption | 86 | 82 | 81 | 84 | 82 |

Recycling: During 1996, the quantity of scrap reprocessed into intermediates was about 2,700 tons, representing approximately 18% of apparent consumption of tungsten in all forms.

Import Sources (1992-95): China, 30%; Russia, 13%; Germany, 10%; Bolivia, 7%; and other, 40%.

| Tariff: Item | Number | Most favored nation (MFN) 12/31/96 | Non-MFN⁴ 12/31/96 |
|---------------------|---------------|---|---|
| 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 | 9.1% ad val. | 58.0% ad val. |
| Ammonium tungstate | 2841.80.0010 | 8.2% ad val. | 49.5% ad val. |
| Tungsten carbide | 2849.90.3000 | 9.5% ad val. | 55.5% ad val. |

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

Government Stockpile: The inventory shown below includes the following quantities of nonstockpile-grade tungsten (tons): ore and concentrate, 10,060; ferrotungsten, 533; metal powder, 151; and carbide powder, 51.

| Material | Stockpile Status—9-30-96 | | | |
|---------------------|---------------------------------|----------------------------|--------------------------------|--------------------------------|
| | Uncommitted inventory | Committed inventory | Authorized for disposal | Disposals Jan.-Sept. 96 |
| Ore and concentrate | 34,600 | — | — | — |
| Metal powder | 900 | — | — | — |
| Ferrotungsten | 900 | — | — | — |
| Carbide powder | 900 | — | — | — |

Events, Trends, and Issues: Apparent consumption of tungsten products increased by about 8% during 1996 compared with that of 1995, resulting from a slowing of the continued growth in the U.S. economy that began in late 1993. Demand for cemented carbide end-use products was particularly strong compared with that of 1995, whereas demand in most other end-use sectors decreased from that of the previous year. Demand for ferrotungsten, however, was about the same.

Availability of tungsten materials from China, the major supplier to the world market, became progressively more limited during 1996. Early in the year, China cut tungsten exports by 5% because of its reduced reserves and weak prices in

TUNGSTEN

the international markets. This was followed by a 1-month annual maintenance shutdown of China's major tungsten mines and ammonium paratungstate plants. By midyear, China had resumed production at approximately one-half of its major tungsten mines. However, most of its small-sized mines were closed owing to shortages of electrical supply.

During 1996, world market supply met demand not through an increase in mine production, but rather through major drawdown of stocks. At midyear, there was no active mining in the Commonwealth of Independent States (CIS), no CIS stock releases in the prior 2 months, and claims by China that no more of their stocks were available. In addition, Russian producers of tungsten concentrate had to operate with prolonged down times owing to low prices, thereby incurring debts. Hence, the future supply of tungsten is uncertain unless more mines are open and new deposits are utilized.

World Mine Production, Reserves, and Reserve Base:

| | Mine production | | Reserves ⁵ | Reserve base ⁵ |
|------------------------------|-----------------|-------------------|-----------------------|---------------------------|
| | 1995 | 1996 ^e | | |
| United States | W | W | 140,000 | 200,000 |
| Australia | — | — | 1,000 | 200,000 |
| Austria | — | — | 10,000 | 15,000 |
| Bolivia | 800 | 800 | 53,000 | 100,000 |
| Brazil | 100 | 100 | 20,000 | 20,000 |
| Burma | 500 | 500 | 15,000 | 34,000 |
| Canada | — | — | 260,000 | 490,000 |
| China | 21,000 | 20,000 | 940,000 | 1,300,000 |
| France | — | — | 20,000 | 20,000 |
| Kazakstan | 100 | 100 | — | 38,000 |
| Korea, North | 900 | 900 | — | 35,000 |
| Korea, Republic of | — | — | 58,000 | 77,000 |
| Portugal | 500 | 500 | 25,000 | 25,000 |
| Russia | 5,400 | 5,400 | 250,000 | 420,000 |
| Tajikistan | 100 | 75 | — | 23,000 |
| Thailand | 60 | 60 | 30,000 | 30,000 |
| Turkmenistan | — | — | — | 10,000 |
| Uzbekistan | 300 | 300 | — | 20,000 |
| Other countries | <u>1,000</u> | <u>1,000</u> | <u>280,000</u> | <u>360,000</u> |
| World total (may be rounded) | 31,000 | 30,000 | 2,100,000 | 3,300,000 |

Collected By
Chinatungsten Online



World Resources: More than 90% of the world's estimated tungsten resources are outside the United States, with about 45% in China. In addition to China and the United States, countries with significant resources are Australia, Austria, Bolivia, Brazil, Burma, Canada, Kazakstan, North Korea, Republic of Korea, Peru, Portugal, Russia, Spain, Tajikistan, Thailand, Turkey, Turkmenistan, and Uzbekistan.

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. An electrodeless, nontungsten lamp was introduced to the market for commercial and industrial use.

^eEstimated. W Withheld to avoid disclosing company proprietary data.

¹Excludes 3 months of withheld data.

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.

⁴See Appendix B.

⁵See Appendix C for definitions.