

MINERAL COMMODITY SUMMARIES 2009

| | | | |
|-----------|----------------|-----------------|----------------|
| Abrasives | Fluorspar | Mercury | Silicon |
| Aluminum | Gallium | Mica | Silver |
| Antimony | Garnet | Molybdenum | Soda Ash |
| Arsenic | Gemstones | Nickel | Sodium Sulfate |
| Asbestos | Germanium | Niobium | Stone |
| Barite | Gold | Nitrogen | Strontium |
| Bauxite | Graphite | Peat | Sulfur |
| Beryllium | Gypsum | Perlite | Talc |
| Bismuth | Hafnium | Phosphate Rock | Tantalum |
| Boron | Helium | Platinum | Tellurium |
| Bromine | Indium | Potash | Thallium |
| Cadmium | Iodine | Pumice | Thorium |
| Cement | Iron Ore | Quartz Crystal | Tin |
| Cesium | Iron and Steel | Rare Earths | Titanium |
| Chromium | Kyanite | Rhenium | Tungsten |
| Clays | Lead | Rubidium | Vanadium |
| Cobalt | Lime | Salt | Vermiculite |
| Copper | Lithium | Sand and Gravel | Yttrium |
| Diamond | Magnesium | Scandium | Zinc |
| Diatomite | Manganese | Selenium | Zirconium |
| Feldspar | | | |

TANTALUM

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

Domestic Production and Use: No significant U.S. tantalum mine production has been reported since 1959. Domestic tantalum resources are of low grade, some mineralogically complex, and most are not commercially recoverable. Companies in the United States produced tantalum alloys, compounds, and metal from imported concentrates, and metal and alloys were recovered from foreign and domestic scrap. Tantalum was consumed mostly in the form of alloys, compounds, fabricated forms, ingot, and metal powder. Tantalum capacitors were estimated to account for more than 60% of tantalum use. Major end uses for tantalum capacitors include automotive electronics, pagers, personal computers, and portable telephones. The value of tantalum consumed in 2007 was estimated at about \$162 million and was expected to be about \$190 million in 2008 as measured by the value of imports.

| Salient Statistics—United States: | 2004 | 2005 | 2006 | 2007 | 2008^e |
|--------------------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------------------|
| Production: | | | | | |
| Mine | — | — | — | — | — |
| Recycling | NA | NA | NA | NA | NA |
| Imports for consumption ^{e, 1} | 1,540 | 1,630 | 1,160 | 1,160 | 1,200 |
| Exports ^{e, 1} | 984 | 984 | 949 | 511 | 600 |
| Government stockpile releases ^{e, 2} | 127 | 210 | 289 | — | — |
| Consumption, apparent | 679 | 852 | 498 | 644 | 600 |
| Price, tantalite, dollars per pound of Ta ₂ O ₅ content ³ | 30 | 35 | 32 | 36 | 36 |
| Net import reliance ⁴ as a percentage of apparent consumption | 100 | 100 | 100 | 100 | 100 |

Recycling: Tantalum was recycled mostly from new scrap that was generated during the manufacture of tantalum-containing electronic components and from tantalum-containing cemented carbide and superalloy scrap.

Import Sources (2004-07): Tantalum contained in niobium (columbium) and tantalum ore and concentrate; tantalum metal; and tantalum waste and scrap—Australia, 18%; China, 14%; Brazil, 12%; Japan, 10%; and other, 46%.

| Tariff: | Item | Number | Normal Trade Relations 12-31-08 |
|----------------|-----------------------------------------|---------------|--------------------------------------------|
| | Synthetic tantalum-niobium concentrates | 2615.90.3000 | Free. |
| | Tantalum ores and concentrates | 2615.90.6060 | Free. |
| | Tantalum oxide ⁵ | 2825.90.9000 | 3.7% ad val. |
| | Potassium fluotantalate ⁵ | 2826.90.9000 | 3.1% ad val. |
| | Tantalum, unwrought: | | |
| | Powders | 8103.20.0030 | 2.5% ad val. |
| | Alloys and metal | 8103.20.0090 | 2.5% ad val. |
| | Tantalum, waste and scrap | 8103.30.0000 | Free. |
| | Tantalum, other | 8103.90.0000 | 4.4% ad val. |

Depletion Allowance:⁶ 22% (Domestic), 14% (Foreign).

Government Stockpile: In fiscal year (FY) 2008 (October 1, 2007, through September 30, 2008), the Defense National Stockpile Center (DNSC), Defense Logistics Agency, sold no tantalum materials. DNSC announced maximum disposal limits for FY 2009 of about 3.63 tons⁷ of tantalum contained in tantalum carbide powder. DNSC exhausted stocks of tantalum minerals in FY 2007; metal powder in FY 2006; metal oxide in FY 2006; and metal ingots in FY 2005.

| Material | Stockpile Status—9-30-08⁶ | | | |
|-------------------------|---------------------------------------------|--------------------------------|------------------------------|--------------------------|
| | Uncommitted inventory | Authorized for disposal | Disposal plan FY 2008 | Disposals FY 2008 |
| Tantalum carbide powder | 1.73 | 1.73 | 73.63 | — |

TANTALUM

Events, Trends, and Issues: U.S. tantalum apparent consumption in 2008 was estimated to decrease about 7% from that of 2007. Tantalum ore and concentrate, metals, and waste and scrap were the leading imported tantalum materials, with each accounting for approximately equal amounts of tantalum. By weight, tantalum mineral concentrate imports for consumption were supplied 77% by Australia and 20% by Canada; metal, 24% by Brazil and 13% each by China and Japan; and waste and scrap, 18% by Australia, 14% by China, and 12% by Brazil. Capital market problems and the subsequent economic slowdown were expected to result in reduced tantalum material consumption, price, and production.

World Mine Production, Reserves, and Reserve Base:

| | Mine production ⁸ | | Reserves ⁹ | Reserve base ⁹ |
|-------------------------------|------------------------------|-------------------------|-----------------------|---------------------------|
| | <u>2007</u> | <u>2008^e</u> | | |
| United States | — | — | — | Negligible |
| Australia | 435 | 435 | 40,000 | 84,000 |
| Brazil | 180 | 180 | 88,000 | 90,000 |
| Canada | 45 | 45 | 3,000 | 3,000 |
| Ethiopia | 77 | 77 | NA | NA |
| Rwanda | 42 | 42 | NA | NA |
| Other countries ¹⁰ | <u>36</u> | <u>36</u> | <u>NA</u> | <u>NA</u> |
| World total (rounded) | 815 | 815 | 130,000 | 180,000 |

World Resources: Identified resources of tantalum, most of which are in Australia, Brazil, and Canada, are considered adequate to meet projected needs. The United States has about 1,500 tons of tantalum resources in identified deposits, all of which are considered uneconomic at 2008 prices.

Substitutes: The following materials can be substituted for tantalum, but usually with less effectiveness: niobium in carbides; aluminum and ceramics in electronic capacitors; glass, niobium, platinum, titanium, and zirconium in corrosion-resistant equipment; and hafnium, iridium, molybdenum, niobium, rhenium, and tungsten in high-temperature applications.

^eEstimated. NA Not available. — Zero.

¹Imports and exports include the estimated tantalum content of niobium and tantalum ores and concentrates, unwrought tantalum alloys and powder, tantalum waste and scrap, and other tantalum articles.

²Disposals reported by DNSC, net quantity (uncommitted inventory).

³Price is an average based on trade journal reported prices.

⁴Defined as imports – exports + adjustments for Government and industry stock changes.

⁵This category includes other than tantalum-containing material.

⁶See Appendix B for definitions.

⁷Actual quantity limited to remaining sales authority or inventory.

⁸Excludes production of tantalum contained in tin slags.

⁹See Appendix C for definitions.

¹⁰Includes Burundi, Congo (Kinshasa), Nigeria, Uganda, and Zimbabwe.