

## TANTALUM

(Data in metric tons, tantalum content, unless otherwise specified)

**Domestic Production and Use:** Tantalum has not been mined in the United States since 1959. Domestic tantalum resources are low grade; some are mineralogically complex, and most are not commercially recoverable. Companies in the United States produced tantalum alloys, capacitors, carbides, compounds, and tantalum metal from imported tantalum ores and concentrates and tantalum-containing materials. Tantalum metal and alloys were recovered from foreign and domestic scrap. Domestic tantalum consumption was not reported by consumers. The value of tantalum consumed in 2023 was estimated to exceed \$205 million as measured by the value of imports.

<b>Salient Statistics—United States:</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023<sup>e</sup></b>
Production:					
Mine	—	—	—	—	—
Secondary	NA	NA	NA	NA	NA
Imports for consumption <sup>1</sup>	1,350	1,200	1,330	1,720	1,100
Exports <sup>1</sup>	427	434	655	662	680
Shipments from Government stockpile <sup>2</sup>	—	-16	-10	—	NA
Consumption, apparent <sup>3</sup>	919	753	663	1,060	<sup>4</sup> 370
Price, tantalite, annual average, dollars per kilogram of Ta <sub>2</sub> O <sub>5</sub> content <sup>5</sup>	161	158	158	214	190
Net import reliance <sup>6</sup> as a percentage of apparent consumption	100	100	100	100	100

**Recycling:** Tantalum was recycled mostly from new scrap generated during the manufacture of tantalum-containing electronic components and from tantalum-containing cemented carbide and superalloy scrap. The amount of tantalum recycled was not available, but it may account for as much as 30% of consumption by domestic primary processors.

**Import Sources (2019–22):** Tantalum ores and concentrates: Australia, 54%; Congo (Kinshasa), 11%; Rwanda, 9%; Mozambique, 7%; and other, 19%. Tantalum metal and powder: China,<sup>7</sup> 42%; Germany, 27%; Kazakhstan, 13%; Thailand, 7%; and other, 11%. Tantalum waste and scrap: Indonesia, 26%; China,<sup>7</sup> 15%; Japan, 14%; Republic of Korea, 7%; and other, 38%. Total: China,<sup>7</sup> 24%; Germany, 13%; Australia, 11%; Indonesia, 9%; and other, 43%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations 12–31–23</b>
	Synthetic tantalum-niobium concentrates	2615.90.3000	Free.
	Niobium ores and concentrates	2615.90.6030	Free.
	Tantalum ores and concentrates	2615.90.6060	Free.
	Tantalum oxide	2825.90.9000	3.7% ad valorem.
	Potassium fluorotantalate	2826.90.9000	3.1% ad valorem.
	Tantalum, unwrought:		
	Powders	8103.20.0030	2.5% ad valorem.
	Alloys and metal	8103.20.0090	2.5% ad valorem.
	Tantalum, waste and scrap	8103.30.0000	Free.
	Tantalum, wrought:		
	Crucibles	8103.91.0000	4.4% ad valorem.
	Other	8103.99.0000	4.4% ad valorem.

**Depletion Allowance:** 22% (domestic), 14% (foreign).

### **Government Stockpile:<sup>8</sup>**

<b>Material</b>	<b>FY 2023</b>		<b>FY 2024</b>	
	<b>Potential acquisitions</b>	<b>Potential disposals</b>	<b>Potential acquisitions</b>	<b>Potential disposals</b>
Tantalum metal	—	0.09	24.00	0.09

**Events, Trends, and Issues:** U.S. tantalum apparent consumption was estimated to be 370 tons, a 65% decrease from that in 2022, and estimated U.S. imports for consumption decreased by 39% compared with those in 2022. The significant decrease in U.S. tantalum imports in 2023 is a reflection of a broader trend in the global market, primarily owing to a decrease in consumer electronics and data center demand. Additionally, the trade has been affected by increased stockpiles after the global coronavirus disease 2019 (COVID-19) pandemic, owing to double ordering influenced by logistics and lead times during the pandemic. Concurrently, estimated U.S. exports increased by 3% in 2023, highlighting a disparity between import and export trends. The value of waste and scrap imports had the most significant increase of 24% compared with that in 2022. In 2023, the average monthly price for tantalum ore was valued at \$190 per kilogram of Ta<sub>2</sub>O<sub>5</sub> content, a decrease of 8% compared with that in 2022.

Prepared by **Chad A. Friedline [(703) 648–7713, cfriedline@usgs.gov]**

## TANTALUM

In October, the United States updated the Export Administration Regulations, which introduced new classifications and broadened restrictions on controlled semiconductor manufacturing items. It also added new license exceptions and detailed compliance guidance, refined controls on United States persons in technology development in China, and expanded geographical destination controls.

Also in October, the United States and several additional entities signed an agreement on the development of the Lobito Corridor and the Zambia-Lobito Rail Line connecting Congo (Kinshasa) and Zambia to Angola's Port of Lobito. When complete, the project is expected to reduce transportation time, lower costs, and decrease the carbon footprint associated with exporting metals and other products.

**World Mine Production and Reserves:** Reserves for Australia and China were revised based on Government reports.

	Mine production		Reserves <sup>9</sup>
	2022	2023 <sup>8</sup>	
United States	—	—	—
Australia	46	43	<sup>10</sup> 110,000
Brazil	<sup>e</sup> 370	360	40,000
Burundi	<sup>e</sup> 59	36	NA
China	<sup>e</sup> 78	79	240,000
Congo (Kinshasa)	<sup>e</sup> 890	980	NA
Nigeria	<sup>e</sup> 110	110	NA
Russia	<sup>e</sup> 31	20	NA
Rwanda	<sup>e</sup> 347	520	NA
Other	<sup>e</sup> 120	<u>260</u>	<u>NA</u>
World total (rounded)	1,990	2,400	NA

**World Resources:**<sup>9</sup> Identified world resources of tantalum, most of which are in Australia, Brazil, Canada, and China, are considered adequate to supply projected needs. The United States has about 55,000 tons of tantalum resources in identified deposits, most of which were considered subeconomic at 2023 prices for tantalum.

**Substitutes:** The following materials can be substituted for tantalum, but a performance loss or higher costs may ensue: niobium and tungsten in carbides; aluminum, ceramics, and niobium in electronic capacitors; glass, molybdenum, nickel, niobium, platinum, stainless steel, titanium, and zirconium in corrosion-resistant applications; and hafnium, iridium, molybdenum, niobium, rhenium, and tungsten in high-temperature applications.

<sup>e</sup>Estimated. NA Not available. — Zero.

<sup>1</sup>Imports and exports include the estimated tantalum content of synthetic tantalum-niobium concentrates, niobium and tantalum ores and concentrates, tantalum waste and scrap, unwrought tantalum alloys and powder, and other tantalum articles. Synthetic concentrates and niobium ores and concentrates were assumed to contain 50% Ta<sub>2</sub>O<sub>5</sub>. Tantalum ores and concentrates were assumed to contain 32% Ta<sub>2</sub>O<sub>5</sub>. Niobium ores and concentrates were assumed to contain 28% Ta<sub>2</sub>O<sub>5</sub>. Ta<sub>2</sub>O<sub>5</sub> is 81.897% tantalum.

<sup>2</sup>Defined as change in total inventory from prior yearend inventory. If negative, increase in inventory. Beginning in 2023, Government stock changes no longer available.

<sup>3</sup>Defined for 2019–22 as production + imports – exports ± adjustments for Government and industry stock changes. Beginning in 2023, Government stock changes no longer included.

<sup>4</sup>Decrease in apparent consumption is due to a decline in imports for consumption caused by stockpiling in 2022.

<sup>5</sup>Sources: CRU Group (2019–21) and the Institute for Rare Earths and Metals (2022–23).

<sup>6</sup>Defined for 2019–22 as imports – exports ± adjustments for Government and industry stock changes. Beginning in 2023, Government stock changes no longer included.

<sup>7</sup>Includes Hong Kong.

<sup>8</sup>See Appendix B for definitions.

<sup>9</sup>See Appendix C for resource and reserve definitions and information concerning data sources.

<sup>10</sup>For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 28,000 tons.