

# TANTALUM

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

**Domestic Production and Use:** Significant U.S. tantalum mine production has not been reported since 1959. Domestic tantalum resources are of 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. Major end uses for tantalum included alloys for gas turbines used in the aerospace and oil and gas industries; tantalum capacitors for automotive electronics, mobile accessories, and personal computers; tantalum carbides for cutting and boring tools; and tantalum oxide (Ta<sub>2</sub>O<sub>5</sub>) was used in glass lenses to make lighter weight camera lenses that produce a brighter image. The value of tantalum consumed in 2022 was estimated to exceed \$320 million as measured by the value of imports.

<b>Salient Statistics—United States:</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022<sup>e</sup></b>
Production:					
Mine	—	—	—	—	—
Secondary	NA	NA	NA	NA	NA
Imports for consumption <sup>1</sup>	1,660	1,380	1,230	1,380	1,700
Exports <sup>1</sup>	681	423	417	628	480
Shipments from Government stockpile <sup>2</sup>	—	—	-16	-10	—
Consumption, apparent <sup>3</sup>	975	956	814	740	1,200
Price, tantalite, annual average, dollars per kilogram of Ta <sub>2</sub> O <sub>5</sub> content <sup>4</sup>	214	161	158	158	150
Net import reliance <sup>5</sup> 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. 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 (2018–21):** Tantalum ores and concentrates: Australia, 43%; Rwanda, 21%; Congo (Kinshasa), 12%; Mozambique, 7%; and other, 17%. Tantalum metal and powder: China,<sup>6</sup> 42%; Germany, 23%; Kazakhstan, 12%; Thailand, 9%; and other, 14%. Tantalum waste and scrap: Indonesia, 23%; China,<sup>6</sup> 17%; Japan, 15%; and other, 45%. Total: China,<sup>6</sup> 24%; Germany, 12%; Australia, 10%; Indonesia, 8%; and other, 46%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations 12–31–22</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 <sup>7</sup>	2825.90.9000	3.7% ad valorem.
	Potassium fluorotantalate <sup>7</sup>	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, other	8103.99.0000	4.4% ad valorem.

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

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

<b>Material</b>	<b>Inventory as of 9–30–22</b>	<b>FY 2022</b>		<b>FY 2023</b>	
		<b>Potential acquisitions</b>	<b>Potential disposals</b>	<b>Potential acquisitions</b>	<b>Potential disposals</b>
Tantalum carbide powder	—	—	1.71	—	—
Tantalum niobium concentrate (gross weight)	92	—	—	—	—
Tantalum metal <sup>9</sup> (gross weight)	0.085	—	0.09	—	0.09
Tantalum alloy (gross weight)	0.0015	—	—	—	—

## TANTALUM

**Events, Trends, and Issues:** U.S. tantalum apparent consumption was estimated to have increased by 66% from that in 2021. In 2022, estimated U.S. imports for consumption increased by 25%. The tantalum imported was in the form of waste and scrap (42%), metal and powder (37%), and ores and concentrates (21%). Waste and scrap imports had the most significant increase, more than doubling from those in 2021. Estimated U.S. exports decreased by 24% in 2022. In 2022, the average monthly price of tantalum ore was valued at \$150 per kilogram of Ta<sub>2</sub>O<sub>5</sub> content, a decrease of 5% compared with that in 2021.

Global tantalum production and consumption were estimated to have increased in 2022 as steel production in most countries continued to rebound from decreases owing to the global coronavirus disease 2019 (COVID-19) pandemic. Buyers sought more raw material supplies after maintaining low stocks in 2021 and there was increased demand from the electronics industry. In 2022, China remained the leading export destination and accounted for approximately 20% of tantalum ores and concentrates, waste and scrap, and metals consumption. Brazil, Congo (Kinshasa), Nigeria, and Rwanda accounted for about 85% of estimated global tantalum production in 2022.

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

	Mine production		Reserves <sup>10</sup>
	2021	2022 <sup>e</sup>	
United States	—	—	—
Australia	44	57	1199,000
Bolivia	1	1	NA
Brazil	<sup>e</sup> 360	370	40,000
Burundi	39	39	NA
China	<sup>e</sup> 76	78	180,000
Congo (Kinshasa)	790	860	NA
Ethiopia	32	24	NA
Mozambique	37	34	NA
Nigeria	110	110	NA
Russia	<sup>e</sup> 39	39	NA
Rwanda	269	350	NA
Uganda	38	38	NA
World total (rounded)	1,840	2,000	NA

**World Resources:**<sup>10</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 2022 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 32% Ta<sub>2</sub>O<sub>5</sub>. Tantalum ores and concentrates were assumed to contain 37% 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.

<sup>3</sup>Defined as production + imports – exports ± adjustments for Government stock changes.

<sup>4</sup>Source: CRU Group. The estimate for 2022 includes data available through April 2022.

<sup>5</sup>Defined as imports – exports ± adjustments for Government stock changes.

<sup>6</sup>Includes Hong Kong.

<sup>7</sup>This category includes tantalum-containing material and other material.

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

<sup>9</sup>Potential disposals are for tantalum scrap in the Government stockpile.

<sup>10</sup>See Appendix C for resource and reserve definitions and information concerning data sources.

<sup>11</sup>For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 39,000 tons.