THALLIUM

(Data in kilograms unless otherwise specified)

Domestic Production and Use: There has been no domestic production of thallium since 1981. Small quantities are consumed annually, but variations in pricing and value complicate making accurate estimates of consumption value. The primary end uses included the following: radioisotope thallium-201 used for medical purposes in cardiovascular imaging; thallium used as an activator (sodium iodide crystal doped with thallium) in electronics for photoelectric cells and gamma radiation detection; thallium-barium-calcium-copper-oxide high-temperature superconductors; thallium used in lenses, prisms, and windows for infrared detection and transmission equipment; thallium-arsenic-selenium crystal filters used for light diffraction in acousto-optical measuring devices; and thallium used in mercury alloys for low temperature low-temperature thermometers and switches. Other uses include as an additive in glass to increase its refractive index and density, a catalyst for organic compound synthesis, a component in high-density liquids (thallium malonate formate or Clerici solution) for gravity separation of minerals.

Salient Statistics—United States:	**2021**	**2022**	**2023**	**2024**	**2025[e]**
Production, refinery	—	—	—	—	—
Imports for consumption:					
Unwrought metal and metal powders	—	—	13	—	—
Waste and scrap	—	13	—	([1])	—
Other articles	7	—	[2]300	—	25
Exports:					
Unwrought metal and powders	190	—	1	—	—
Waste and scrap	—	—	—	—	—
Other articles	378	2,150	3,800	3,190	2,800
Consumption, estimated[3]	7	13	13	—	25
Price, metal, dollars per kilogram[e, 4]	8,400	9,400	8,800	9,500	9,300
Net import reliance[5] as a percentage of estimated consumption	NA	NA	NA	NA	NA

Recycling: None.

Import Sources (2021–2024): Mexico, 90%; France, 4%, Japan, 4%; and Israel, 2%.

Tariff: Item	**Number**	**Normal Trade Relations 12–31–25**
Unwrought and powders	8112.51.0000	4% ad valorem.
Waste and scrap	8112.52.0000	Free.
Other	8112.59.0000	4% ad valorem.

Depletion Allowance: 14% (domestic and foreign).

Government Stockpile: None.

Events, Trends, and Issues: As of July 2025, there were no reported imports or exports of unwrought thallium metal. Also, there have been no reported imports or exports of thallium waste and scrap since 2023. However, according to data from the U.S. Census Bureau, a significant quantity of thallium waste and scrap (1,620 kilograms) was imported to Puerto Rico from the Dominican Republic in July 2024, marking a notable shift as this country had not been an import source in previous years. This was likely due to the misclassification of commodities such as medical devices or equipment containing thallium. Exports of thallium articles also decreased to 2,800 kilograms in 2025 from 3,190 kilograms in 2024 and 3,800 kilograms in 2023. Data on inventory for domestic use remained unavailable.

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THALLIUM

The primary global uses for thallium include gamma radiation detection equipment, high-temperature superconductors, infrared optical materials, low-melting glass, photoelectric cells, and radioisotopes. Demand for thallium in medical nuclear imaging applications continued to decline owing to the superior performance and availability of alternatives, such as technetium-99m, although thallium was still used in certain cardiovascular stress tests. Research continued into innovative applications for thallium, including enhancements in scintillators for radiation detection and new thallium compounds for optoelectronic devices.

Thallium metal and its compounds are highly toxic materials and are strictly controlled to prevent harm to humans and the environment. Thallium and its compounds can enter the human body by skin contact, ingestion, or inhalation of dust or fumes. Under its national primary drinking water regulations, the U.S. Environmental Protection Agency has set an enforceable Maximum Contaminant Level of 2 parts per billion thallium in drinking water.

World Refinery Production and Reserves:[6] Thallium is produced commercially in only a few countries as a byproduct recovered from flue dust in the roasting of copper, lead, and zinc ores. Because most producers withhold thallium production data, global production data were limited. In 2023 (the latest year for which data were available), global production of thallium was estimated to be about 10,000 kilograms. China, Kazakhstan, and Russia were estimated to be leading producers of primary thallium. Substantial thallium-rich deposits have been identified in Brazil, China, North Macedonia, and Russia. Quantitative estimates of reserves were not available, owing to the difficulty in identifying deposits where thallium can be extracted economically. Previous estimates of reserves were based on the thallium content of zinc ores.

World Resources:[6] Although thallium is reasonably abundant in the Earth's crust, estimated at about 0.7 part per million, it exists mostly in association with potassium minerals in clays, granites, and soils, and it is not generally considered to be commercially recoverable from those materials. The major source of recoverable thallium is from trace amounts found in sulfide ores of copper, lead, zinc, and other metallic elements. Recent studies in northeastern China have revealed volcano-related uranium-molybdenum-thallium mineralization, indicating additional geologic environments in which thallium resources may be present. As such, world resources of thallium are adequate to supply world requirements.

Substitutes: Although other materials and formulations can substitute for thallium in gamma radiation detection equipment and optics used for infrared detection and transmission, thallium materials are presently superior and more cost effective for these very specialized uses. The medical isotope technetium-99m is being used in cardiovascular-imaging applications instead of thallium. Nontoxic substitutes, such as tungsten compounds, are being marketed as substitutes for thallium in high-density liquids for gravity separation of minerals.

[e]Estimated. NA Not available. — Zero.

[1]Imports of thallium waste and scrap, HTS code 8112.52.000, were reported by the U.S. Census Bureau as 1,620 kilograms in 2024. However, this number may include material that may have been misclassified.

[2]Includes material that may have been misclassified.

[3]Estimated to be equal to total imports for 2021–22 and 2024–25. In 2023, consumption was estimated to be equal to imports of unwrought metal and metal powders.

[4]Estimated average price of thallium 99.99%-pure granules in 100-gram lots from three retailers and producers as of November 7, 2025.

[5]Defined as imports – exports. Consumption and exports of unwrought thallium were from imported material or from a drawdown in unreported inventories.

[6]See Appendix C for resource and reserve definitions and information concerning data sources.