

MERCURY

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

Domestic Production and Use: Mercury has not been produced as a principal mineral commodity in the United States since 1992. In 2022, mercury was recovered as a byproduct from processing gold-silver ore at several mines in Nevada; however, production data were not reported. Secondary, or recycled, mercury was recovered from batteries, compact and traditional fluorescent lamps, dental amalgam, medical devices, and thermostats, as well as mercury-contaminated soils. The U.S. Environmental Protection Agency reported a revised domestic production of 45 tons in 2018 (the last year for which data were available), and about 82 tons of mercury was stored by manufacturers or producers. The reported domestic consumption of mercury and mercury in compounds in products was 16 tons. The leading domestic end uses of mercury and mercury compounds were dental amalgam, 43%; relays, sensors, switches, and valves, 41%; bulbs, lamps, and lighting, 8%; formulated products (buffers, catalysts, fixatives, and vaccination uses), 7%; and batteries and other end uses, 1%. A large quantity of mercury (about 245 tons) is used domestically in manufacturing processes such as catalysts or as a cathode in the chlorine-caustic soda (chloralkali) process. Almost all the mercury is reused in the process. The leading manufacturing processes that use mercury are mercury-cell chloralkali plants. In 2022, only one mercury-cell chloralkali plant operated in the United States. Until December 31, 2012, domestic- and foreign-sourced mercury was refined and then exported for global use, primarily for small-scale gold mining in many parts of the world. Beginning January 1, 2013, export of elemental mercury from the United States was banned, with some exceptions, under the Mercury Export Ban Act of 2008. Effective January 1, 2020, exports of five mercury compounds were added to that ban.

Salient Statistics—United States:

	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022^e</u>
Production:					
Mine (byproduct)	NA	NA	NA	NA	NA
Secondary	NA	NA	NA	NA	NA
Imports for consumption, metal (gross weight)	6	9	3	1	2
Exports, metal (gross weight)	—	—	—	—	—
Price, average unit value of imports, dollars per kilogram	7	23	26	29	33
Net import reliance ¹ as a percentage of apparent consumption	NA	NA	NA	NA	NA

Recycling: In 2022, eight facilities operated by six companies in the United States accounted for most of the secondary mercury produced and were authorized by the U.S. Department of Energy (DOE) to temporarily store mercury until the DOE's long-term facility opens. Mercury-containing automobile convenience switches, barometers, compact and traditional fluorescent bulbs, computers, dental amalgam, medical devices, and thermostats were collected by smaller companies and shipped to the refining companies for retorting to reclaim the mercury. In addition, many collection companies recovered mercury when retorting was not required. With the rapid replacement of compact and traditional fluorescent lighting by light-emitting-diode (LED) lighting, more mercury was being recycled.

Import Sources (2018–21): Canada, 69%; China, 31%; and other, <1%.

<u>Tariff:</u>	<u>Item</u>	<u>Number</u>	<u>Normal Trade Relations</u> <u>12–31–22</u>
	Mercury	2805.40.0000	1.7% ad valorem.
	Amalgams	2843.90.0000	3.7% ad valorem.

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

Government Stockpile:² The Defense Logistics Agency Strategic Materials held and managed an inventory of 4,437 tons of mercury in storage at the Hawthorne Army Depot in Hawthorne, NV. On December 3, 2019, the DOE selected a site near Andrews, TX, to store up to 6,800 tons of mercury. Sales of mercury from the stockpiles remained suspended.

<u>Material</u>	<u>Inventory</u> <u>as of 9–30–22</u>	<u>FY 2022</u>		<u>FY 2023</u>	
		<u>Potential</u> <u>acquisitions</u>	<u>Potential</u> <u>disposals</u>	<u>Potential</u> <u>acquisitions</u>	<u>Potential</u> <u>disposals</u>
Mercury	4,437	—	—	—	—

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Events, Trends, and Issues: Owing to mercury toxicity and concerns for the environment and human health, overall mercury use has declined in the United States and worldwide. According to the United Nations Environment Programme (UNEP) Global Mercury Partnership 2018 report, the top five leading sources of anthropogenic mercury emissions were artisanal and small-scale gold mining (37.7%), stationary combustion of coal (21.3%), nonferrous-metal production (14.7%), cement production (10.5%), and waste from products (6.6%). Mercury is no longer used in most batteries and paints manufactured in the United States. Some button-type batteries, cleansers, fireworks, folk medicines, grandfather clocks, pesticides, and skin-lightening creams and soaps may still contain mercury. Mercury compounds were used as catalysts in the coal-based manufacture of vinyl chloride monomer in China. In some parts of the world, mercury was used in the recovery of gold in artisanal and small-scale mining operations. Conversion to nonmercury technology for chloralkali production and the ultimate closure of the world's mercury-cell chloralkali plants may release a large quantity of mercury to the global market for recycling, sale, or, owing to export bans in Europe and the United States, long-term storage.

Byproduct mercury production is expected to continue from large-scale domestic and foreign gold-silver mining and processing, as is secondary production of mercury from an ever-diminishing supply of mercury-containing products. Domestic mercury consumption will continue to decline owing to increased use of LED lighting and consequent reduced use of conventional fluorescent tubes and compact fluorescent bulbs and continued substitution of non-mercury-containing products in control, dental, and measuring applications.

World Mine Production and Reserves:

	Mine production ^o		Reserves ³
	2021	2022	
United States	NA	NA	Quantitative estimates of reserves were not available. China, Kyrgyzstan, and Peru have the largest reserves.
China	2,000	2,000	
Kyrgyzstan	20	6	
Mexico (net exports)	39	40	
Morocco	2	2	
Norway	20	20	
Peru (exports)	30	30	
Tajikistan	120	120	
World total (rounded) ⁴	2,200	2,200	

World Resources:³ China, Kyrgyzstan, Mexico, Peru, Russia, Slovenia, Spain, and Ukraine have most of the world's estimated 600,000 tons of mercury resources. Mexico reclaims mercury from Spanish colonial silver-mining waste. In Spain, once a leading producer of mercury, mining at its centuries-old Almaden Mine stopped in 2003. In the United States, mercury occurrences are in Alaska, Arkansas, California, Nevada, and Texas. The declining consumption of mercury, except for small-scale gold mining, indicates that these resources are sufficient for centuries of use.

Substitutes: Ceramic composites substitute for the dark-gray mercury-containing dental amalgam. "Galinstan," an alloy of gallium, indium, and tin, replaces the mercury used in traditional mercury thermometers, and digital thermometers have replaced traditional thermometers. At chloralkali plants around the world, mercury-cell technology is being replaced by newer diaphragm and membrane-cell technology. LEDs that contain indium substitute for mercury-containing fluorescent lamps. Lithium, nickel-cadmium, and zinc-air batteries replace mercury-zinc batteries in the United States; indium compounds substitute for mercury in alkaline batteries; and organic compounds are being used instead of mercury fungicides in latex paint.

^oEstimated. NA Not available. — Zero.

¹Defined as imports – exports ± adjustments for Government stock changes.

²See Appendix B for definitions.

³See Appendix C for resource and reserve definitions and information concerning data sources.

⁴Excludes U.S. production.