

# Mercury

---

*Prepared by the Minerals and Metals Sector,  
Natural Resources Canada.  
Telephone: (613) 947-6580  
E-mail: info-mms@nrcan.gc.ca*

Named after the Roman god of commerce, travel and thievery, mercury has been used for more than 3000 years. Its chemical symbol, Hg, comes from the Latin word *hydrargyrum* meaning “liquid silver.” Also known to many as quicksilver, mercury was known to the ancient Chinese and Hindus before 2000 B.C. It has also been found in tubes in Egyptian tombs dating from about 1500 B.C. The first recorded mention of the metal was by Aristotle in the fourth century B.C. when the heavy, silvery white metal was used to form amalgams with other metals. It was also used in ointments and cosmetics.

Until the 1960s, mercury was used primarily as a flowing mercury cathode for the electrolysis of an aqueous sodium chloride solution to yield chlorine and caustic soda. Process losses to the environment became a concern and many chlor-alkali plants were either closed or converted to diaphragm cell or ion exchange technologies. Worldwide demand for this application continues to be the single largest use for mercury, but is declining as older facilities are being closed and replaced with mercury-free technology.

Batteries are another major market for mercury that is experiencing a decline as manufacturers switch to alternative metals. The third but also shrinking market for mercury is in electrical applications. Uses range from metallic mercury switches in thermostats to mercury-vapour discharge lamps. Other uses include dental amalgams, temperature- and pressure-measuring devices, detonators, pigments, and pharmaceuticals. Increased concerns related to the risks of exposure to human health and the environment have led to increased restrictions on the uses of mercury; however, its unique properties will likely guarantee its use in some key sectors, such as energy-efficient fluorescent lamps, for the foreseeable future.

Mercury is a naturally occurring element that is unique amongst the metals in that it is liquid at ambient temperature. At room temperature, mercury is a silvery white

colour. It is solid white below its melting point of  $-38.9^{\circ}\text{C}$  and is a colourless gas above its boiling point of  $356.9^{\circ}\text{C}$ . Mercury exists in nature in some 25 different minerals but is most commonly recovered from the red sulphide mineral known as cinnabar (HgS). Other common mercury ores include corderoite and livingstonite. Native mercury metal exists in nature but is rare. Mercury deposits are generally formed at relatively low temperatures in the world's major orogenic belts.

## MERCURY IN CANADA

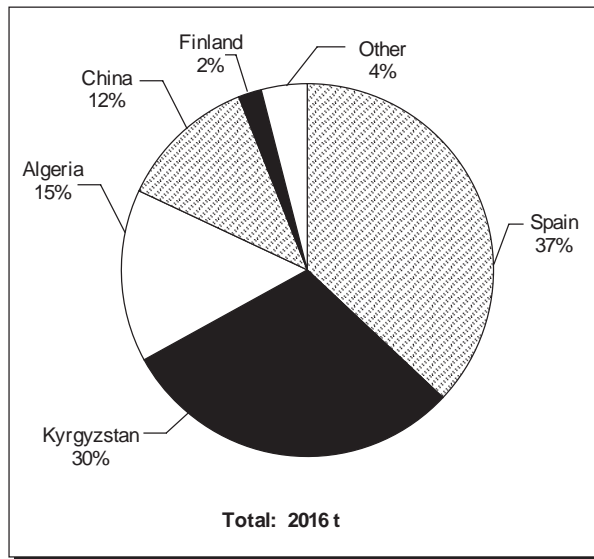
Since the closure of the Pinchi Lake mine in 1975, Canada no longer produces primary mercury metal and it has been primarily an imported commodity. With the increase in concern related to environmental releases of mercury, the use of mercury in Canada continues to decline. In 2002, Canada used a total of 4.9 t of metallic mercury, primarily for applications in electrical apparatus, industrial and control instruments, and for the electrolytic preparation of chlorine at the one remaining chlor-alkali plant for use in the pulp and paper industry. The use of mercury for applications such as gold recovery, industrial chemicals, and paints and pigments has been phased out.

## WORLD DEVELOPMENTS

World mine production of mercury was 2016 t in 2002, compared to 1785 t in 2001. Spain is the world's largest producer followed by Kyrgyzstan, Algeria and China. Together these four countries accounted for just over 93% of the world's total production of mercury in 2002. Mercury recovered from primary sources accounts for about 60% of world use, with the remainder supplied from recycled sources.

In the United States, an estimated 15 t of mercury are recovered as a by-product of gold mining in Nevada, California and Utah. Recycled production greatly outweighs production from primary sources. Sales of mercury by the Defense Logistics Agency (DLA) from the National Defense Stockpile remain suspended pending the completion of an analysis of the potential environmental impact of the sales.

**Figure 1**  
**World Production of Mercury, 2002**



Source: International Consultative Group on Nonferrous Metals Statistics.

Elsewhere in the world, mines in Slovenia, Turkey and the Ukraine remained closed. By-product production from mining continues in Finland, India, Tajikistan, Mexico and Chile.

The United Nations Economic Commission for Europe Heavy Metals Protocol came into force on December 29, 2003, following its ratification by Germany. Germany's ratification brings the number of signatories to 16, the minimum number required for the protocol to come into force. The protocol controls emissions of lead, cadmium and mercury. Under its terms, the 35 signatory governments from Western and Eastern Europe, together with Canada and the United States, must, where applicable, phase out the use of leaded petrol and lower emissions from products such as mercury in batteries. The protocol also calls for governments to consider tighter controls on

the use of mercury-containing products, such as thermostats, switches, thermometers, manometers, barometers, fluorescent lamps, dental amalgam, pesticides and paint.

## PRICE AND OUTLOOK

The commercial unit for handling mercury is the "flask," which weighs 34.47 kg (76 lb). Prices for mercury peaked in 1988 at US\$335.52/flask and have since declined. Mercury prices reached their lowest level in September 1991 at US\$85/flask. *Metal Bulletin* reported free market prices for mercury started the year at US\$155-\$175/flask, rising slightly in May to \$175-\$200/flask until November, and remained in the \$180-\$220 range (per flask in warehouse) to the end of 2003 (for lots sold containing 50 flasks or more). Tightness in the market for mercury contributed to the higher prices towards the end of the year. The Almadan mine in Spain stopped production in the last four months of 2003 to install a new gas cleaning system. Production at Almadan is expected to resume in 2004, but the market is expected to remain tight. Prices are forecast to remain high, in the US\$300/flask range, for most of 2004.

*Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 64. (2) Information in this review was current as of May 14, 2004. (3) This and other reviews, including previous editions, are available on the Internet at [www.nrcan.gc.ca/mms/cmy/com\\_e.html](http://www.nrcan.gc.ca/mms/cmy/com_e.html).*

### NOTE TO READERS

**The intent of this document is to provide general information and to elicit discussion. It is not intended as a reference, guide or suggestion to be used in trading, investment, or other commercial activities. The author and Natural Resources Canada make no warranty of any kind with respect to the content and accept no liability, either incidental, consequential, financial or otherwise, arising from the use of this document.**

### TARIFFS

Item No.	Description	Canada			United States
		MFN	GPT	USA	Canada
2617.90.00.90	Mercury ores and concentrates	Free	Free	Free	Free
2805.40	Mercury	Free	Free	Free	Free
2825.90.10.20	Mercury oxides	4%	Free	Free	Free

Sources: Canadian Customs Tariff, effective January 2004, Canada Border Services Agency; Harmonized Tariff Schedule of the United States, 2004.

**TABLE 1. CANADA, MERCURY TRADE AND USE, 2001-03**

Item No.	2001		2002		2003	
	(kg)	(\$000)	(kg)	(\$000)	(kg)	(\$000)
<b>EXPORTS</b>						
2805.40	Mercury					
	United States					
	8 045	17	11 254	22	6 420	13
<b>IMPORTS</b>						
2805.40	Mercury					
	United States					
	6 709	62	5 638	53	8 086	79
	Sweden					
	–	–	–	–	290	3
	Switzerland					
	15	...	10	...	11	...
	Cayman Islands					
	–	–	–	–	4	...
	France					
	31	...	55	...	–	–
	Spain					
	665	3	1 388	16	–	–
	Argentina					
	–	–	1 040	7	–	–
	Germany					
	–	–	212	2	–	–
	United Kingdom					
	–	–	5	...	–	–
	<b>Total</b>					
	7 420	65	8 348	78	8 391	82
2825.90.10.20	Mercury oxides					
	United States					
	416	7	675	12	252	4
	Germany					
	22	...	32	1	17	...
	Mexico					
	–	–	2	...	2	...
	Spain					
	–	–	–	–	2	...
	<b>Total</b>					
	438	7	709	13	273	4
<b>USE (Metal) (1)</b>						
Electrical apparatus, industrial and control instruments						
	x		x		x	
Electrolytic preparation of chlorine and caustic soda and other uses						
	x		x		x	
<b>Total</b>						
	5 605		2 131		4 865	

Sources: Natural Resources Canada; Statistics Canada.

– Nil; ... Amount too small to be expressed; x Confidential.

(1) Available data as reported by consumers.

Note: Numbers may not add to totals due to rounding.

**TABLE 2. WORLD PRODUCTION OF MERCURY, 1998-2002**

Country	1998	1999	2000	2001	2002
(tonnes)					
Algeria	224.1	240.3	215.6	320.1	307.1
Chile	5.0	6.5	7.0	7.5	7.5
China	225.0	195.0	203.0	193.0	250.0
Finland	54.0	55.0	76.1	71.2	50.6
India	25.0	25.0	25.0	25.0	25.0
Kyrgyzstan	637.6	645.9	550.0	574.4	600.0
Mexico	15.0	15.0	15.0	15.0	15.0
Slovenia	5.0	–	–	–	–
Spain	675.0	433.0	236.6	524.0	726.0
Tajikistan	35.0	35.0	40.0	40.0	20.0
United States	15.0	15.0	15.0	15.0	15.0
<b>Total world</b>	<b>1 915.7</b>	<b>1 655.7</b>	<b>1 383.3</b>	<b>1 785.2</b>	<b>2 016.2</b>

Sources: Natural Resources Canada; International Consultative Group on Nonferrous Metals Statistics.

– Nil.