

# Mercury

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**N**amed 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 it 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 Cominco Ltd.'s 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 1998, the last year publicly available data were published, Canada used a total of 2.8 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. Canada exported 8 t of mercury in 2001 valued at \$17 000, compared to 4.0 t in 2000 worth \$25 000. Imports totalled 0.4 t valued at \$7000 in 2001, the same as in 2000.

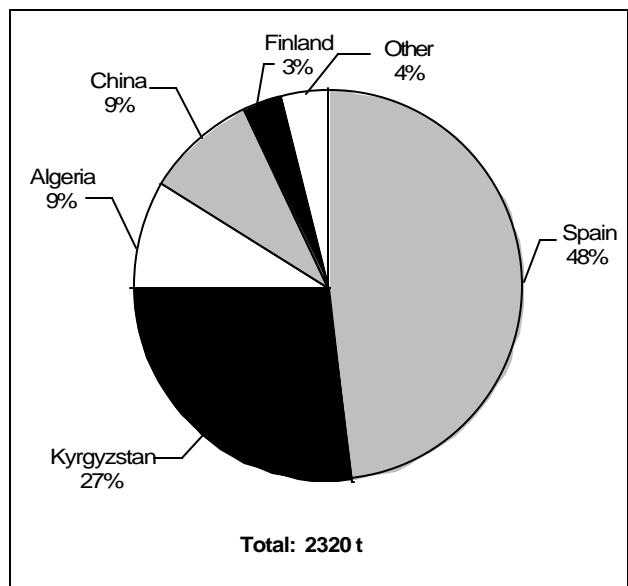
## WORLD DEVELOPMENTS

World production of mercury has been declining steadily over the past few years. Total world production was 2320 t in 2000, compared to 2543 t in 1999. Spain is the world's largest producer followed by Kyrgyzstan, Algeria and China. Together these four countries accounted for just over 92% of the world's total production of mercury in 2000. Mercury recovered from primary sources accounts for about 60% of world use with the remainder supplied from recycled sources.

In the United States, about 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 remained suspended in 2001 pending the completion of an analysis of the potential environmental impact of the sales.

Elsewhere in the world, mines in Slovenia, Turkey and the Ukraine remained closed. By-product production from mining continues in Finland, Tajikistan, Mexico and Chile. The decommissioning of mercury chlor-alkali plants in Europe and elsewhere remains a significant source of recycled mercury. Plant closures in Finland, Norway, the United Kingdom and South Africa have contributed some 360 t since 1997. Further plant closures and conversions are planned. There are some 100 mercury cell chlor-alkali plants still in operation worldwide.

**Figure 1**  
**World Production of Mercury, 2000**



Source: International Consultative Group on Nonferrous Metals Statistics.

## 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. North American mercury prices started 2001 at US\$135-\$150/flask, rose slightly in June and remained at \$154/flask to the end of the year (for lots sold containing 50 flasks or more). North American prices are expected to remain in the \$140-\$160/flask range in 2002. In the longer term, prices are expected to remain relatively stable as demand in mercury's remaining markets stabilizes.

*Notes: (1) Information in this review was current as of April 19, 2002. (2) This and other reviews, including previous editions, are available on the Internet at [www.nrcan.gc.ca/mms/cmy/index\\_e.html](http://www.nrcan.gc.ca/mms/cmy/index_e.html).*

### NOTE TO READERS

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**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: *Customs Tariff*, effective January 2002, Canada Customs and Revenue Agency; *Harmonized Tariff Schedule of the United States*, 2002.

**TABLE 1. CANADA, MERCURY TRADE, 1999-2001, AND USE, 1998-2000**

Item No.	1999		2000		2001 (p)		
	(kg)	(\$000)	(kg)	(\$000)	(kg)	(\$000)	
<b>EXPORTS</b>							
2805.40	Mercury						
	United States	1 778	8	4 108	25	8 045	17
	Total	1 778	8	4 108	25	8 045	17
<b>IMPORTS</b>							
2805.40	Mercury						
	United States	9 150	82	11 664	92	6 709	62
	Spain	–	–	–	–	665	3
	Germany	258	3	21	...	–	–
	Other countries	26	...	24	...	46	...
	Total	9 434	85	11 709	92	7 420	65
2825.90.10.20	Mercury oxides						
	United States	522	9	419	7	416	7
	Germany	635	11	16	...	22	...
	United Kingdom	127	2	–	–	–	–
	Switzerland	–	–	2	...	–	–
	Total	1 284	22	437	7	438	7
		<b>1998</b>		<b>1999</b>		<b>2000 (p)</b>	
				(kg)			
<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	
	Total	2 803		x		x	

Sources: Natural Resources Canada; Statistics Canada.

– Nil; ... Amount too small to be expressed; (p) Preliminary; x Confidential.

(1) Available data as reported by users.

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

**TABLE 2. WORLD PRODUCTION OF MERCURY, 1995-2000**

Country	1995	1996	1997	1998	1999	2000 (p)
	(tonnes)					
Algeria	295.1	368.1	490.4	224.1	240.3	215.6
Chile	9.0	5.0	4.0	5.0	6.5	7.0
China	780.0	508.0	835.0	225.0	196.0	203.0
Finland	90.2	88.1	63.0	54.0	55.0	77.1
Kyrgyzstan	380.0	660.0	611.0	629.1	628.5	630.0
Mexico	15.0	15.0	15.0	15.0	15.0	15.0
Slovenia	–	5.0	5.0	5.0	–	–
Spain	1 497.0	1 052.8	863.0	675.0	1 351.9	1 093.7
Tajikistan	50.0	45.0	40.0	35.0	35.0	40.0
Ukraine	40.0	30.0	–	–	–	–
United States	15.0	15.0	15.0	15.0	15.0	15.0
Total world	3 171.3	2 792.0	2 941.4	1 902.2	2 543.2	2 320.4

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

– Nil; (p) Preliminary.