

CADMIUM

(Data in metric tons of cadmium content, unless otherwise noted)

Domestic Production and Use: Only two companies produced cadmium in the United States in 2003. One company produced primary cadmium in Tennessee as a byproduct of smelting and refining zinc metal from sulfide ore while the other company produced cadmium from scrap in Pennsylvania, mainly from spent nickel-cadmium (NiCd) batteries. Based on the average New York dealer price, the combined output of primary and secondary metal was valued at about \$430,000 in 2003. Consumption of cadmium during the past 3 years declined by about 70% in response to environmental concerns. About 78% of total apparent consumption was for batteries. The remaining 22% was distributed as follows: pigments, 12%; coatings and plating, 8%; stabilizers for plastics, 1.5%; and nonferrous alloys and other, 0.5%.

Salient Statistics—United States:	1999	2000	2001	2002	2003^e
Production, refinery ¹	1,190	1,890	680	700	640
Imports for consumption, metal	294	425	107	25	30
Exports of metal, alloys, scrap	20	314	272	194	250
Shipments from Government stockpile excesses	550	319	34	693	80
Consumption, apparent	1,850	2,010	659	560	530
Price, metal, dollars per pound ²	0.14	0.16	0.23	0.29	0.30
Stocks, yearend, producer and distributor	893	1,200	1,090	1,750	1,720
Employment, smelter and refinery	NA	NA	NA	NA	NA
Net import reliance ³ as a percentage of apparent consumption	9	6	E	E	E

Recycling: Cadmium recycling thus far has been practical only for NiCd batteries, some alloys, and dust from electric arc furnaces (EAF). The exact amount of recycled cadmium is unknown. In 2003, the U.S. steel industry generated more than 0.6 million ton of EAF dust, typically containing 0.003% to 0.07% cadmium.

Import Sources (1999-2002): Metal: Australia, 36%; Belgium, 30%; Canada, 24%; and other, 10%.

Tariff: Item	Number	Normal Trade Relations⁴ 12/31/03
Cadmium sulfide	2830.30.0000	3.1% ad val.
Pigments and preparations based on cadmium compounds	3206.30.0000	3.1% ad val.
Unwrought cadmium; waste and scrap; powders	8107.10.0000	Free.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile: After record sales from the Government stockpile in 2002, remaining 270 tons of cadmium metal held by the U.S. Defense Logistic Agency was sold in 2003.

Stockpile Status—9-30-03⁵

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2003	Disposals FY 2003
Cadmium	—	—	—	270	270

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Events, Trends, and Issues: Cadmium production continued to decline in 2003. During the past decade, regulatory pressure to reduce or even eliminate the use of cadmium has gained momentum in many developed countries. In the United States, Federal and State environmental agencies regulate the production and use of heavy metals such as cadmium. To help unify different standards used by these agencies, the U.S. Environmental Protection Agency created a list of persistent and bioaccumulative toxic pollutants. Cadmium is 1 of 11 metals on the list, and its use is targeted for a 50% reduction by 2005. The European Union (EU) is evaluating a proposal to ban all Ni-Cd batteries containing more than 0.002% cadmium beginning on January 1, 2008, and to increase the collection rate for all spent industrial and automotive batteries to 95% by weight by December 31, 2003. According to some cadmium experts, the EU proposal fails to differentiate among different forms of cadmium with disparate toxicity and fails to consider the environmental effect of metals and chemicals that are expected to replace cadmium in all applications.

World Refinery Production, Reserves, and Reserve Base:

	Refinery production		Reserves ⁶	Reserve base ⁶
	2002	2003 ^e		
United States	700	640	90,000	270,000
Australia	350	380	110,000	300,000
Belgium	117	100	—	—
Canada	896	900	55,000	100,000
China	2,500	2,600	90,000	380,000
Germany	422	300	6,000	8,000
India	450	450	3,000	5,000
Japan	2,500	2,700	10,000	15,000
Kazakhstan	600	600	50,000	100,000
Korea, Republic of	1,900	1,850	—	—
Mexico	1,200	1,300	35,000	40,000
Russia	950	950	16,000	30,000
Other countries	<u>3,220</u>	<u>2,200</u>	<u>140,000</u>	<u>550,000</u>
World total (rounded)	15,800	15,000	600,000	1,800,000

World Resources: Zinc-bearing coals of the central United States and Carboniferous-age coals of other countries also contain large subeconomic resources of cadmium.

Substitutes: NiCd batteries are being replaced in some applications with lithium-ion and nickel-metal hydride batteries. However, the higher cost of these substitutes restricts their use. Except where the surface characteristics of a coating are critical (e.g., fasteners for aircraft), coatings of zinc or vapor-deposited aluminum can substitute for cadmium in many plating applications. Cerium sulfide is used as a replacement for cadmium pigments, mostly in plastics.

^eEstimated. E Net exporter. NA Not available. — Zero.

¹Primary and secondary metal.

²Average New York dealer price for 99.95% purity in 5-short-ton lots. Source: Platts Metals Week.

³Defined as imports – exports + adjustments for Government and industry stock changes.

⁴No tariff for Canada and Mexico for items shown.

⁵See Appendix B for definitions.

⁶See Appendix C for definitions. Significant changes from previous reports are based on new information.