

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 2002. 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 \$370,000 in 2002. Consumption of cadmium during the past 3 years declined by about 50% in response to environmental concerns. About 75% of total apparent consumption was for batteries. The remaining 25% was distributed as follows: pigments, 12%; coatings and plating, 8%; stabilizers for plastics, 4%; and nonferrous alloys and other, 1%.

Salient Statistics—United States:	1998	1999	2000	2001	2002^e
Production, refinery ¹	1,240	1,190	1,890	680	700
Imports for consumption, metal	514	294	425	107	10
Exports of metal, alloys, scrap	180	20	314	272	300
Shipments from Government stockpile excesses	190	550	319	52	50
Consumption, apparent	2,100	1,850	2,010	679	560
Price, metal, dollars per pound ²	0.28	0.14	0.16	0.15	0.30
Stocks, yearend, producer and distributor	729	893	1,200	1,090	890
Employment, smelter and refinery	NA	NA	NA	NA	NA
Net import reliance ³ as a percentage of apparent consumption	38	9	6	E	E

Recycling: To date, cadmium recycling 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 2002, the U.S. steel industry generated more than 0.6 million tons of EAF dust, typically containing 0.003% to 0.07% cadmium.

Import Sources (1998-2001): Metal: Canada, 39%; Australia, 29%; Belgium, 23%; and other, 9%.

Tariff: Item	Number	Normal Trade Relations⁴ 12/31/02
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:

Material	Stockpile Status—9-30-02⁵				
	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2002	Disposals FY 2002
Cadmium	269	97	269	544	530

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Events, Trends, and Issues: Cadmium production remained relatively low in 2002. At the end of 2000, a major zinc producer decided to cease production of primary cadmium, and even after upgrading its facilities in mid-2002, the company chose not to resume production of cadmium due to low prices and loss of the domestic market for NiCd batteries. 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 one of 11 metals on the list, and it 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 failed to differentiate between different forms of cadmium with disparate toxicity and failed 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: Reserves and reserve base estimates for China have been significantly increased based on new published information from that country.

	Refinery production		Reserves ⁶	Reserve base ⁶
	2001	2002 ^e		
United States	680	700	90,000	270,000
Australia	378	350	110,000	300,000
Belgium	1,240	1,100	—	—
Canada	1,180	1,250	55,000	150,000
China	2,400	2,450	90,000	380,000
Germany	1,100	1,000	6,000	8,000
Japan	2,490	2,500	10,000	15,000
Korea, Republic of	1,880	1,850	—	—
Mexico	1,420	1,500	35,000	40,000
Russia	950	900	16,000	30,000
Other countries	4,480	5,100	190,000	610,000
World total (may be rounded)	18,200	18,700	600,000	1,800,000

World Resources: Estimated world reserves of cadmium were about 0.6 million tons based on zinc resources containing about 0.3% cadmium. 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.