

CADMIUM

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

Domestic Production and Use: Two companies in the United States produced refined cadmium in 2017. One company, operating in Tennessee, recovered primary refined cadmium as a byproduct of zinc leaching from roasted sulfide concentrates. The other company, operating in Ohio, recovered secondary cadmium metal from spent nickel-cadmium (NiCd) batteries. Domestic production and consumption of cadmium were withheld to avoid disclosing company proprietary data. Cadmium metal and compounds are mainly consumed for alloys, coatings, NiCd batteries, pigments, and plastic stabilizers.

Salient Statistics—United States:	2013	2014	2015	2016	2017^e
Production, refined ¹	W	W	W	W	W
Imports for consumption:					
Unwrought cadmium and powders	284	133	237	240	290
Wrought cadmium and other articles (gross weight)	104	6	18	(2)	2
Cadmium waste and scrap (gross weight)	(2)	—	71	52	50
Exports:					
Unwrought cadmium and powders	131	198	350	157	140
Wrought cadmium and other articles (gross weight)	266	72	246	371	190
Cadmium waste and scrap (gross weight)	20	—	(2)	12	(2)
Consumption, reported, refined	W	W	W	W	W
Price, metal, annual average, dollars per kilogram ³	1.92	1.94	1.47	1.34	1.70
Stocks, yearend, producer and distributor	W	W	W	W	W
Net import reliance ⁴ as a percentage of apparent consumption	<25	E	E	<25	<25

Recycling: Secondary cadmium is mainly recovered from spent consumer and industrial NiCd batteries. Other waste and scrap from which cadmium can be recovered includes copper-cadmium alloy scrap, some complex nonferrous alloy scrap, and cadmium-containing dust from electric arc furnaces.

Import Sources (2013–16):⁵ Canada, 50%; China, 18%; Australia, 14%; Mexico, 7%; and other, 11%.

Tariff: Item	Number	Normal Trade Relations 12–31–17
Cadmium oxide	2825.90.7500	Free.
Cadmium sulfide	2830.90.2000	3.1% ad val.
Pigments and preparations based on cadmium compounds	3206.49.6010	3.1% ad val.
Unwrought cadmium and powders	8107.20.0000	Free.
Cadmium waste and scrap	8107.30.0000	Free.
Wrought cadmium and other articles	8107.90.0000	4.4% ad val.

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

Government Stockpile: None.

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Events, Trends, and Issues: Most of the world's primary cadmium metal was produced in Asia, and leading global producers were China, the Republic of Korea, and Japan. A smaller amount of secondary cadmium metal was recovered from recycling NiCd batteries. Although detailed data on the global consumption of primary cadmium were not available, NiCd battery production was thought to have continued to account for the majority of global cadmium consumption. Other end uses for cadmium and cadmium compounds included alloys, anticorrosive coatings, pigments, polyvinyl chloride (PVC) stabilizers, and semiconductors for solar cells.

The average monthly cadmium price began 2017 at \$1.49 per kilogram in January and trended upward to \$1.72 per kilogram in May. Prices then decreased during the next 3 months, falling to an average of \$1.55 per kilogram in August, before increasing to an average of about \$2.00 per kilogram in October. News sources attributed the overall increase in price in the first 10 months of 2017 to continued strong demand for cadmium in India, mostly for jewelry alloys. India's net imports of unwrought cadmium and cadmium powders in the first half of 2017 were 2,310 tons, 5% more than those in the first half of 2016 and almost 12 times more than those in the first half of 2013.

World Refinery Production and Reserves:

	Refinery production		Reserves ⁶
	2016	2017 ^e	
United States ¹	W	W	Quantitative estimates of reserves are not available. The cadmium content of typical zinc ores averages about 0.03%. See the Zinc chapter for zinc reserves.
Canada	2,310	1,700	
China	8,200	8,200	
Japan	1,990	2,200	
Kazakhstan	1,500	1,500	
Korea, Republic of	3,600	3,600	
Mexico	1,190	1,100	
Netherlands	630	630	
Peru	820	780	
Russia	1,300	1,300	
Other countries	2,400	2,400	
World total (rounded)	⁷ 23,900	⁷ 23,000	

World Resources: Cadmium is generally recovered from zinc ores and concentrates. Sphalerite, the most economically significant zinc ore mineral, commonly contains minor amounts of cadmium, which shares certain similar chemical properties with zinc and often substitutes for zinc in the sphalerite crystal lattice. The cadmium mineral greenockite is frequently associated with weathered sphalerite and wurtzite. Zinc-bearing coals of the Central United States and Carboniferous age coals of other countries also contain large subeconomic resources of cadmium.

Substitutes: Lithium-ion and nickel-metal hydride batteries can replace NiCd batteries in many applications. Except where the surface characteristics of a coating are critical (for example, fasteners for aircraft), coatings of zinc, zinc-nickel, or vapor-deposited aluminum can be substituted for cadmium in many plating applications. Cerium sulfide is used as a replacement for cadmium pigments, mostly in plastics. Barium-zinc or calcium-zinc stabilizers can replace barium-cadmium stabilizers in flexible PVC applications. Amorphous silicon and copper-indium-gallium-selenide photovoltaic cells compete with cadmium telluride in the thin-film solar-cell market.

^eEstimated. E Net exporter. W Withheld to avoid disclosing company proprietary data. — Zero.

¹Cadmium metal produced as a byproduct of zinc refining plus metal from recycling.

²Less than ½ unit.

³Average New York dealer price for 99.95% purity in 5-short-ton lots (2013–15). Source: Platts Metals Week. Average free market price for 99.95% purity in 10-ton lots; cost, insurance, and freight; global ports (2016). Source: Metal Bulletin.

⁴Defined as imports of unwrought metal and metal powders – exports of unwrought metal and metal powders + adjustments for industry stock changes.

⁵Imports for consumption of unwrought metal and metal powders (Harmonized Tariff Schedule code 8107.20.0000).

⁶See [Appendix C](#) for resource and reserve definitions and information concerning data sources.

⁷Excludes U.S. production.