INDIUM

(Data in metric tons, unless otherwise noted)

Domestic Production and Use: Indium was not recovered from ores in the United States in 2000. Domestically produced standard grade indium was derived from the upgrading of lower grade imported indium metal. Two companies, one each in New York and Rhode Island, were the major producers of indium metal and indium products in 2000. Several firms produced high-purity indium shapes, alloys, and compounds. Thin-film coatings, which are used in applications such as liquid crystal displays (LCD's) and electroluminescent lamps, continued to be the largest end use. Indium semiconductor compounds were used in infrared detectors, high-speed transistors, and high-efficiency photovoltaic devices. The estimated distribution of uses in 2000 was about the same as in 1999, with a slight increase in semiconductors and stable consumption in other sectors: coatings, 49%; solders and alloys, 33%; electrical components and semiconductors, 14%; and research and other, 4%. The estimated value of primary indium metal consumed in 2000, based upon the annual average price, was more than $10 million.

Salient Statistics—United States:	1996	1997	1998	1999	2000[e]
Production, refinery	—	—	—	—	—
Imports for consumption	33.2	85.5	75	77	70
Exports	NA	NA	NA	NA	NA
Consumption[e]	45	50	50	52	55
Price, annual average, dollars per kilogram (99.97% indium)	370	309	296	303	188
Stocks, producer, yearend	NA	NA	NA	NA	NA
Employment, number	NA	NA	NA	NA	NA
Net import reliance[1] as a percent of estimated consumption[e]	NA	100	100	100	100

Recycling: Small quantities of old scrap were recycled. Recycling of new scrap, the scrap from fabrication of indium products, is becoming more significant. Recycling occurred previously when the price of indium was relatively very high and/or increasing rapidly. Now it has become an important part of foreign production, but it was significant in the United States only in 1996.

Import Sources (1996-99): Canada, 45%; China, 22%; Russia, 12%; France, 9%; and other, 12%.

Tariff: Item	Number	Normal Trade Relations 12/31/00
Unwrought, waste and scrap	8112.91.3000	Free.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: The last indium held in the National Defense Stockpile was sold in December 1998.

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INDIUM

Events, Trends, and Issues: Estimated domestic indium consumption increased modestly to about 55 tons in 2000. After 3 years of relative stability, the price of indium dropped considerably in 2000. Expanding LCD manufacture in Asia was more than matched by adequate supply and greater efficiency in processing. Despite a strong increase in LCD production, the ready availability of low-priced indium from China forced world prices down. The long range outlook for the indium market remains promising despite current and near term market fluctuations.

World Refinery Production, Reserves, and Reserve Base:

	Refinery production[e]		Reserves[2]	Reserve base[2]
	1999	2000		
United States	—	—	300	600
Belgium	35	35	([3])	([3])
Canada	35	35	700	2,000
China	40	40	400	1,000
France	43	43	([3])	([3])
Japan	25	30	100	150
Peru	4	4	100	150
Russia	15	15	200	300
Other countries	20	20	800	1,500
World total (may be rounded)	215	220	2,600	5,700

World Resources: Indium occurs predominantly in solid solution in sphalerite, a sulfide ore of zinc. Significant quantities of indium also are contained in ores of copper, lead, and tin, but there is not enough information to formulate reliable estimates of indium resources, and most of these deposits are subeconomic for indium. Indium is recovered almost exclusively as a byproduct of zinc. Estimates of the average indium content of the Earth's crust range from 50 to 200 parts per billion. The average indium content of zinc deposits ranges from less than 1 part per million to 100 parts per million. The highest known concentrations of indium occur in vein or replacement sulfide deposits, usually associated with tin-bearing minerals. However, this type of deposit is usually difficult to process economically.

Substitutes: Gallium arsenide can substitute for indium phosphide in solar cells and semiconductor applications. Silver-zinc oxide or tin oxide are lower cost substitutes for indium-tin oxide in transparent conductive coatings for glass. Hafnium can replace indium alloys for use in nuclear reactor control rods.

[e]Estimated. NA Not available.

[1]Defined as imports - exports + adjustments for Government and industry stock changes; exports were assumed to be no greater than the difference between imports and consumption.

[2]Estimate based on the indium content of zinc ores. See Appendix C for definitions.

[3]Reserves for European countries are included in "Other countries."