

## ZINC

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

**Domestic Production and Use:** The value of zinc mined in 1996 was about \$800 million. Essentially all came from 22 mines, and about 77% of it came from only 5 mines. More than 93% of the total mine output was from Alaska, Missouri, New York, and Tennessee; Alaska alone accounted for more than half. Three primary and eight secondary smelters refined zinc metal of commercial grade in 1996. About 75% of slab zinc consumption was in Illinois, Indiana, Michigan, New York, Ohio, and Pennsylvania. Of the total slab zinc consumed, about 55% was used in galvanizing, 20% in zinc-base alloys, 11% in brass and bronze, and 14% in other uses. Zinc compounds and dusts were used principally by the agricultural, chemical, paint, and rubber industries. Major coproducts of zinc mining and smelting were cadmium, germanium, lead, silver, and sulfur.

<b>Salient Statistics—United States:</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996<sup>e</sup></b>
Production: Mine, recoverable <sup>1</sup>	523	488	570	614	620
Primary slab zinc	272	240	217	232	230
Secondary slab zinc	128	141	139	131	130
Imports for consumption:					
Ore and concentrate	45	33	27	10	10
Refined zinc	644	724	793	856	840
Exports: Ore and concentrate	307	311	389	424	430
Refined zinc	1	1	6	3	1
Shipments from Government stockpile	—	18	39	14	20
Consumption: Apparent, refined zinc	1,050	1,120	1,180	1,240	1,240
Apparent, all forms	1,280	1,340	1,400	1,460	1,470
Price, average, cents per pound:					
Domestic producers	58.4	46.2	49.3	55.8	51.0
London Metal Exchange, cash	56.2	43.6	45.3	46.8	46.0
Stocks, slab zinc, yearend	82	77	80	71	60
Employment: Mine and mill <sup>e</sup> , number	2,300	2,500	2,700	2,700	2,700
Smelter primary <sup>e</sup> , number	1,500	1,300	1,000	1,000	1,000
Net import reliance <sup>2</sup> as a percent of apparent consumption of:					
Refined zinc	61	67	70	71	70
All forms of zinc	33	36	35	35	33

**Recycling:** In 1996, an estimated 355,000 tons of zinc in waste and scrap, including 115,000 tons in old scrap, was recovered in the form of slab zinc, brass, zinc-base alloys, dust, oxide, and other chemicals. Another 50,000 tons of zinc in scrap was exported, whereas 35,000 tons was imported.

**Import Sources (1992-95):** Ore and concentrate: Mexico, 52%; Peru, 33%; Canada, 5%; and other, 10%. Metal: Canada, 60%; Mexico, 11%; Spain, 9%; Peru, 5%; and other, 15%. Combined total: Canada, 60%; Mexico, 13%; Spain, 9%; and other, 18%.

<b>Tariff: Item</b>	<b>Number</b>	<b>Most favored nation (MFN) <u>12/31/96</u></b>	<b>Canada <u>12/31/96</u></b>	<b>Mexico <u>12/31/96</u></b>	<b>Non-MFN<sup>3</sup> <u>12/31/96</u></b>
Ore and concentrate	2608.00.0030	1.0¢/kg on lead content	0.3¢/kg on lead content	Free	3.7¢/kg on zinc content.
Unwrought metal	7901.11.0000	1.5% ad val.	0.3% ad val.	Free	5.0% ad val.
Alloys, casting-grade	7901.12.1000	12.6% ad val.	3.8% ad val.	13.3% ad val.	45.0% ad val.
Alloys	7901.20.0000	12.6% ad val.	3.8% ad val.	Free	45.0% ad val.
Waste and scrap	7902.00.0000	Free	Free	Free	11.0% ad val.
Hard zinc spelter	2620.11.0000	0.9% ad val.	0.3% ad val.	1.0% ad val.	5.0% ad val.
Zinc oxide	2817.00.0000	Free	Free	Free	5.5% ad val.

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

**Government Stockpile:**

**Stockpile Status—9-30-96**

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposals Jan.-Sept. 96
Zinc	259	5	259	13

**Events, Trends, and Issues:** Domestic mine production increased slightly in 1996, because of increased output at the Red Dog Mine in Alaska, the leading producer in the United States. Exports of zinc ore and concentrate increased slightly, to 430 tons. The United States is expected to remain the world's largest exporter of zinc concentrates and importer of zinc metal for at least the next decade, because of inadequate refinery production capacity. Available primary annual capacity in 1996 was 250,000 tons.

Domestic zinc consumption continued its upward trend. Most zinc metal was used for galvanizing and alloy production. The United States is the largest consumer of zinc and zinc products, but domestic metal production capacity accounts for less than one-fourth of the quantity consumed. Canada and Mexico are the leading sources of zinc to the United States, because of their geographical proximity and low tariffs. The North American Free Trade Agreement, which went into effect on January 1, 1994, lowered tariffs on zinc and zinc-containing products from Canada and Mexico.

**World Mine Production, Reserves, and Reserve Base:**

	Mine production <sup>4</sup>		Reserves <sup>5</sup>	Reserve base <sup>5</sup>
	1995	1996 <sup>e</sup>		
United States	644	650	16,000	50,000
Australia	930	900	17,000	65,000
Canada	1,110	1,120	21,000	56,000
China	950	1,000	5,000	9,000
Mexico	364	350	6,000	8,000
Peru	689	700	7,000	12,000
Other countries	<u>2,430</u>	<u>2,490</u>	<u>72,000</u>	<u>130,000</u>
World total (may be rounded)	7,120	7,200	140,000	330,000

**World Resources:** Conventional identified zinc resources of the world are about 1.8 billion tons. Zinc-bearing coals, mostly in the central United States, also have a resource potential of millions of tons of zinc that could be recovered during coal beneficiation.

**Substitutes:** Aluminum, plastics, and magnesium are major competitors as diecasting materials. Aluminum, steel, and plastics substitute for galvanized sheet. Plastic coatings, paint, and cadmium and aluminum alloy coatings replace zinc for corrosion protection; aluminum alloys are used in place of brass. Many elements are substitutes for zinc in chemical, electronic, and pigment uses.

<sup>e</sup>Estimated.

<sup>1</sup>Zinc recoverable after smelting and refining.

<sup>2</sup>Defined as imports - exports + adjustments for Government and industry stock changes.

<sup>3</sup>See Appendix B.

<sup>4</sup>Zinc content of concentrate and direct shipping ore.

<sup>5</sup>See Appendix C for definitions.