

## ZINC

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

**Domestic Production and Use:** The value of zinc mined in 2006, based on contained zinc recoverable from concentrate, was about \$2.32 billion. It was produced in 6 States at 11 mines operated by 7 companies. Alaska, Missouri, Montana, and Washington accounted for about 99% of domestic mine output; the Red Dog Mine in Alaska accounted for about 80% of total U.S. production. Two primary and 12 large- and medium-sized secondary smelters refined zinc metal of commercial grade in 2006. Of zinc metal consumed, about 75% was used in Illinois, Indiana, Michigan, New York, Ohio, and Pennsylvania, mostly by steel companies. Of the total zinc consumed, about 55% was used in galvanizing, 21% in zinc-base alloys, 16% in brass and bronze, and 8% in other uses. Zinc compounds and dust were used principally by the agriculture, chemical, paint, and rubber industries. Major coproducts of zinc mining and smelting, in order of decreasing tonnage, were lead, sulfuric acid, cadmium, silver, gold, and germanium.

<b>Salient Statistics—United States:</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006<sup>e</sup></b>
Production:					
Mine, zinc in ore <sup>1</sup>	780	768	739	748	725
Primary slab zinc	182	187	188	191	120
Secondary slab zinc	113	116	117	118	150
Imports for consumption:					
Ore and concentrate	122	164	231	156	115
Refined zinc	874	758	812	668	810
Exports:					
Ore and concentrate	822	841	745	786	760
Refined zinc	1	2	3	1	1
Shipments from Government stockpile	11	14	29	20	38
Consumption:					
Apparent, refined zinc	1,180	1,080	1,160	999	1,120
Apparent, all forms	1,420	1,340	1,400	1,230	1,350
Price, average, cents per pound:					
Domestic producers <sup>2</sup>	38.6	40.6	52.5	67.1	145.0
London Metal Exchange (LME), cash	35.3	37.5	47.5	62.7	140.0
Stocks, slab zinc, yearend	78	73	73	71	71
Employment:					
Mine and mill, number <sup>e</sup>	1,500	1,000	600	600	650
Smelter primary, number <sup>e</sup>	600	600	600	600	250
Net import reliance <sup>3</sup> as a percentage of apparent consumption:					
Refined zinc	75	72	73	69	76
All forms of zinc	62	58	60	56	63

**Recycling:** In 2006, an estimated 350,000 tons of zinc was recovered from waste and scrap; about 30% was recovered in the form of slab zinc and the remainder in alloys, oxide, and chemicals. Of the total amount of scrap recycled, 305,000 tons was derived from new scrap, and 45,000 tons was derived from old scrap. About 55,000 tons of scrap was exported, mainly to China, and 14,000 tons was imported, most of which came from Canada (85%).

**Import Sources (2002-05):** Ore and concentrate: Peru, 62%; Australia, 18%; Ireland, 11%; Mexico, 8%; and other, 1%. Metal: Canada, 63%; Mexico, 18%; Kazakhstan, 4%; Brazil, 4%; and other, 11%. Waste and scrap: Canada, 88%; Mexico, 10%; and other, 2%. Combined total: Canada, 53%; Mexico, 16%; Peru, 13%; Australia, 5%; and other, 13%.

<b>Tariff: Item</b>	<b>Number</b>	<b>Normal Trade Relations<sup>4</sup> 12-31-06</b>
Ore and concentrate	2608.00.0030	Free.
Unwrought metal	7901.11.0000	1.5% ad val.
Alloys, casting-grade	7901.12.1000	3% ad val.
Alloys	7901.20.0000	3% ad val.
Waste and scrap	7902.00.0000	Free.
Hard zinc spelter	2620.11.0000	Free.
Zinc oxide	2817.00.0000	Free.

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

## ZINC

**Government Stockpile:****Stockpile Status—9-30-06<sup>5</sup>**

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2006	Disposals FY 2006
Zinc	13	2	13	45	36

**Events, Trends, and Issues:** The LME cash settlement price of zinc increased substantially in 2006, exceeding \$4,000 per ton for several days in September. The rapid price increase was the result of several factors: a 15-year low in LME stocks of zinc, increased world demand, tight world supply, and investment buying. World mine and refinery production both increased in 2006, driven primarily by China and India. Exclusive of China, world refined zinc consumption outpaced supply. The high prices have resulted in the reopening and expansion of zinc mines worldwide in 2006 with more planned in 2007.

One of the two primary zinc smelters in the United States closed in late January 2006, removing 100,000 tons per year of production capacity. The smelter was sold later in the year, and the new company plans to reopen the facility to recover zinc from electric arc furnace (EAF) dust from steel mills in addition to zinc concentrates. Initial annual production capacity of zinc from EAF dust was projected to be 30,000 tons. One zinc mine in New York was restarted in 2006, after a 5-year closure. The ore from the mine was processed in Canada. Three zinc mines in Tennessee, which have been closed since 2001, were scheduled to reopen in the second quarter of 2007, according to the new owner.

The United States remained one of the leading consumers of zinc and zinc products. However, domestic metal production capacity, both primary and secondary, accounts for less than one-third of the quantity consumed domestically. Canada and Mexico are the leading sources of zinc for the United States because of their geographical proximity and because of trade agreements. Concentrate, metal, and scrap can be imported duty free from those sources.

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

	Mine production <sup>6</sup>		Reserves <sup>7</sup>	Reserve base <sup>7</sup>
	2005	2006 <sup>e</sup>		
United States	748	725	30,000	90,000
Australia	1,330	1,400	33,000	80,000
Canada	755	725	11,000	31,000
China	2,450	2,500	33,000	92,000
Kazakhstan	400	450	30,000	35,000
Mexico	470	450	8,000	25,000
Peru	1,200	1,210	16,000	20,000
Other countries	<u>2,400</u>	<u>2,500</u>	<u>59,000</u>	<u>87,000</u>
World total (rounded)	9,800	10,000	220,000	460,000

**World Resources:** Identified zinc resources of the world are about 1.9 billion tons.

**Substitutes:** Aluminum, steel, and plastics substitute for galvanized sheet. Aluminum, plastics, and magnesium are major competitors as diecasting materials. 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 was reported for mine production prior to Mineral Commodity Summaries 2001.

<sup>2</sup>Platts Metals Week price for North American Special High Grade zinc.

<sup>3</sup>Defined as imports – exports + adjustments for Government and industry stock changes.

<sup>4</sup>No tariff for Canada and Mexico for items shown.

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

<sup>6</sup>Zinc content of concentrate and direct shipping ore.

<sup>7</sup>See Appendix C for definitions.