

COPPER

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

Domestic Production and Use: Domestic mine production in 2003 declined to 1.12 million tons and was valued at about \$2.0 billion. The principal mining States, in descending order, Arizona, Utah, and New Mexico, accounted for 99% of domestic production; copper was also recovered at mines in three other States. Although copper was recovered at 22 mines operating in the United States, just 13 mines accounted for more than 99% of production. Three primary smelters, 4 electrolytic and 3 fire refineries, and 12 solvent extraction-electrowinning facilities operated during the year. Refined copper and direct melt scrap were consumed at about 30 brass mills; 15 rod mills; and 500 foundries, chemical plants, and miscellaneous consumers. Copper and copper alloy products were used in building construction, 46%; electric and electronic products, 23%; transportation equipment, 10%; industrial machinery and equipment, 10%; and consumer and general products, 11%.¹

Salient Statistics—United States:	1999	2000	2001	2002	2003^e
Production:					
Mine	1,600	1,450	1,340	1,140	1,120
Refinery:					
Primary	1,890	1,590	1,630	1,440	1,270
Secondary	230	209	172	70	60
Copper from all old scrap	381	357	316	207	210
Imports for consumption:					
Ores and concentrates	143	(²)	46	72	10
Refined	837	1,060	991	927	860
Unmanufactured	1,280	1,350	1,400	1,230	1,100
Exports:					
Ores and concentrates	64	116	45	23	14
Refined	25	94	23	26	80
Unmanufactured	395	650	556	506	680
Consumption:					
Reported refined	2,980	3,030	2,620	2,370	2,270
Apparent unmanufactured ³	3,130	3,100	2,500	2,610	2,370
Price, average, cents per pound:					
Domestic producer, cathode	75.9	88.2	76.9	75.8	82
London Metal Exchange, high-grade	71.3	82.2	71.6	70.7	78
Stocks, yearend, refined, held by U.S. producers, consumers, and metal exchanges	565	334	952	1,030	740
Employment, mine and mill, thousands	10.3	9.1	8.2	7.0	6.8
Net import reliance ⁴ as a percentage of apparent consumption	27	37	22	37	38

Recycling: Old scrap, converted to refined metal and alloys, provided 210,000 tons of copper, equivalent to 9% of apparent consumption. Purchased new scrap, derived from fabricating operations, yielded 770,000 tons of contained copper; about 87% of the copper contained in new scrap was consumed at brass or wire-rod mills. Of the total copper recovered from scrap (including aluminum- and nickel-base scrap), brass mills recovered 70%; copper smelters and refiners, 6%; ingot makers, 12%; and miscellaneous manufacturers, foundries, and chemical plants, 12%. Copper in all old and new, refined or remelted scrap contributed 31% of the U.S. copper supply.

Import Sources (1999-2002): Unmanufactured: Canada, 29%; Peru, 25%; Chile, 25%; Mexico, 13%; and other, 8%. Refined copper accounted for 72% of unwrought copper imports.

Tariff: Item	Number	Normal Trade Relations⁵ 12/31/03
Copper ores and concentrates	2603.00.0000	1.7¢/kg lead content.
Unrefined copper; anodes	7402.00.0000	Free.
Refined and alloys; unwrought	7403.00.0000	1.0% ad val.
Copper wire (rod)	7408.11.6000	3.0% ad val.

Depletion Allowance: 15% (Domestic), 14% (Foreign).

Government Stockpile: The stockpile of about 20,000 tons of refined copper was liquidated in 1993. The stockpile of about 8,100 tons of brass was liquidated in 1994. Details on inventories of beryllium-copper master alloys (4% beryllium) can be found in the section on beryllium.

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Events, Trends, and Issues: Following an interruption in 2002, world mine production resumed its upward trend. This happened despite production cutbacks at mines in the United States, Chile, and Peru that were intended to help reduce global oversupply. Chile accounted for most of the increase in global mine production and capacity (650,000 tons) principally owing to completion of the phase 4 expansion of the Escondida Mine. According to preliminary data compiled by the International Copper Study Group,⁶ global production of refined copper for the first 7 months of 2003 declined by over 150,000 tons compared with the same period of 2002, while world use of refined copper, buoyed by a 16% rise in apparent use in China, increased by about 275,000 tons. As a result, the production surplus of the preceding years was reversed, and reported global inventories declined by about 300,000 tons. Copper prices rose accordingly; the COMEX spot price averaged \$0.82 per pound in September, the highest level since February 2001.

Production cutbacks in the United States from prior years carried forward into 2003. ASARCO Incorporated reduced production at its Mission Mine in Arizona to about 22,000 tons per year, dropping its operating rate to just 15% of capacity. The cutback also affected downstream operations at the company's Hayden, AZ, smelter and its Amarillo, TX, refinery.⁷ Asarco was granted permission by the U.S. Department of Justice to sell its interest in Southern Peru Copper Corp. A continued slump in domestic copper consumption of both wire and brass mill products was attributed by industry to weak commercial construction, telecommunications, and numismatic markets; industry destocking; and rising imports of manufactured items, especially from China, now the world's largest consumer of copper. (For details, see USGS Mineral Industry Surveys, Copper in June 2002). Except for the anticipated restart of one mine in Montana that closed in 2000 owing to high utility costs, little change in the domestic market is projected for 2004.

World Mine Production, Reserves, and Reserve Base: Official reserves data reported by Poland may include properties being considered for future development. Revisions to other countries were based on updated tabulations of resources reported by companies on individual properties.

	Mine production		Reserves ⁸	Reserve base ⁸
	2002	2003 ^e		
United States	1,140	1,120	35,000	70,000
Australia	883	870	24,000	43,000
Canada	600	580	7,000	20,000
Chile	4,580	4,860	150,000	360,000
China	585	565	26,000	63,000
Indonesia	1,160	1,170	32,000	38,000
Kazakhstan	490	480	14,000	20,000
Mexico	330	330	27,000	40,000
Peru	843	850	30,000	60,000
Poland	503	500	30,000	48,000
Russia	695	700	20,000	30,000
Zambia	330	330	19,000	35,000
Other countries	<u>1,500</u>	<u>1,500</u>	<u>60,000</u>	<u>110,000</u>
World total (rounded)	13,600	13,900	470,000	940,000

World Resources: Land-based resources are estimated to be 1.6 billion tons of copper, and resources in deep-sea nodules are estimated to be 700 million tons. In the United States, discovered resources are estimated to contain 350 million tons of copper, and undiscovered deposits are estimated to contain 290 million tons of copper.

Substitutes: Aluminum substitutes for copper in various products, such as electrical power cables, electrical equipment, automobile radiators, and cooling/refrigeration tubing. In some applications, titanium and steel are used in heat exchangers, and steel is used for artillery shell casings. Optical fiber substitutes for copper in some telecommunications applications. Plastics also substitute for copper in water pipe, plumbing fixtures, and many structural applications.

^eEstimated.

¹Some electrical components are included in each end use. Distribution by Copper Development Association, 2002.

²Less than ½ unit.

³Defined as primary refined production + copper from old scrap converted to refined metal and alloys + refined imports – refined exports ± changes in refined stocks. In 1999, 2000, 2001, 2002, and 2003, general imports of 915,000 tons, 1,020,000 tons, 1,200,000 tons, 1,060,000 tons, and 680,000 tons, respectively, were used to calculate apparent consumption.

⁴Defined as imports – exports + adjustments for Government and industry stock changes for refined copper.

⁵No tariff for Canada and Mexico for items shown.

⁶International Copper Study Group, 2003, Copper Bulletin: Lisbon, Portugal, International Copper Study Group, v. 10, no. 10, October, 46 p.

⁷ASARCO Incorporated, 2002, Asarco to reduce Mission Unit copper production to 15 percent of total capacity: Phoenix, AZ, ASARCO Incorporated press release, December 20, 1 p.

⁸ See Appendix C for definitions.