

## SILVER

(Data in metric tons<sup>1</sup> of silver content, unless otherwise noted)

**Domestic Production and Use:** In 2002, U.S. mine production of silver was about 1,470 tons with an estimated value of \$214 million. Nevada was the largest producer, with more than 600 tons. Precious metal ores accounted for approximately one-half of domestic silver production; the remainder was recovered as a byproduct from the processing of copper, lead, and zinc ores. There were 21 principal refiners of commercial-grade silver, with an estimated total output of approximately 2,900 tons. About 30 fabricators accounted for more than 90% of the silver consumed in arts and industry. The remainder was consumed mostly by small companies and artisans. Aesthetic uses of silver for decorative articles, jewelry, tableware, and coinage were overshadowed by industrial and technical uses. Industrial and technical uses include photographic materials, electrical and electronic products, catalysts, brazing alloys, dental amalgam, and bearings.

<b>Salient Statistics—United States:</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002<sup>e</sup></b>
Production:					
Mine	2,060	1,950	1,860	1,740	1,470
Refinery:					
Primary	2,300	2,000	2,780	2,640	2,900
Secondary	1,700	1,500	1,680	1,060	1,600
Imports for consumption <sup>2</sup>	3,330	2,660	3,810	3,310	3,630
Exports <sup>2</sup>	2,250	481	279	963	885
Consumption, apparent <sup>e</sup>	5,300	5,500	6,300	5,800	5,340
Price, dollars per troy ounce <sup>3</sup>	5.54	5.25	5.00	4.39	4.52
Stocks, yearend:					
Treasury Department <sup>4</sup>	582	617	220	220	220
COMEX, CBT <sup>5</sup>	2,360	2,360	2,920	3,342	3,272
National Defense Stockpile	1,030	778	458	200	—
Employment, mine and mill, <sup>6</sup> number	1,550	1,500	1,500	1,100	1,100
Net import reliance <sup>7</sup> as a percentage of apparent consumption <sup>e</sup>	43	39	43	44	61

**Recycling:** About 1,100 tons of silver was recovered from old and new scrap in 2001.

**Import Sources<sup>2</sup> (1998-2001):** Canada, 40%; Mexico, 37%; Peru, 7%; United Kingdom, 3%; and other, 13%.

**Tariff:** No duties are imposed on imports of unrefined silver or refined bullion.

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

**Government Stockpile:** The Defense Logistics Agency (DLA) has transferred all of the remaining silver in the National Defense Stockpile to the U.S. Mint for use in the manufacture of numismatic and bullion coins. Under an agreement with the U.S. Department of the Treasury, the metal will continue to be carried as DLA stocks until the metal is consumed by the Mint. The transfer marked the end of silver requirements in the National Defense Stockpile.

<b>Material</b>	<b>Stockpile Status—9-30-02<sup>8</sup></b>				<b>Disposals FY 2002</b>
	<b>Uncommitted inventory</b>	<b>Committed inventory</b>	<b>Authorized for disposal</b>	<b>Disposal plan FY 2002</b>	
Silver	21	21	21	249	300

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**Events, Trends, and Issues:** Digital imaging has become a serious threat to silver-based photographic applications. In contrast to the use of silver halide film in conventional photography, digital technology converts images directly into electronic form, thereby avoiding the need for silver. Silver halide pictures may also be scanned into electronic form, which necessitates the use of silver in taking and printing the picture, but eliminates the need for silver halide technology in further processing.

A considerable amount of silver is a byproduct of zinc mining. The closure of several uneconomic zinc mines owing to low zinc prices indicates a trend that may become significant to world silver output. Although some of the mines have been closed permanently, others have been placed on standby until zinc prices improve. Together, the closed zinc mines represent a loss of approximately 80 tons per year of silver. In addition, mine production cuts in copper will eliminate another 60 tons per year of silver output. These zinc and copper cuts are small when compared with global silver production of more than 18,000 tons in 2001. However, more cuts in the United States could significantly reduce domestic mined silver output in 2002 and beyond.

**World Mine Production, Reserves, and Reserve Base:** A decrease in estimated silver reserves for Canada, an increase in estimated silver reserves for Peru, and the inclusion of reserves and reserve base estimates for China were based on new information from those countries.

	Mine production		Reserves <sup>9</sup>	Reserve base <sup>9</sup>
	2001	2002 <sup>e</sup>		
United States	1,740	1,470	25,000	80,000
Australia	2,100	2,200	31,000	37,000
Canada	1,270	1,300	16,000	35,000
China	1,800	1,800	26,000	115,000
Mexico	2,760	2,800	37,000	40,000
Peru	2,350	2,300	36,000	37,000
Other countries	6,680	8,500	104,000	180,000
World total (may be rounded)	18,700	18,800	270,000	520,000

**World Resources:** More than two-thirds of world silver resources are associated with copper, lead, and zinc deposits, often at great depths. The remainder is in vein deposits in which gold is the most valuable metallic component. Although most recent discoveries have been primarily gold and silver deposits, significant future reserves and resources are expected from major base metal discoveries that contain silver. Although the price of silver and improved technology may appear to increase the reserves and reserve base, the extraction of silver from these resources will be driven by demand for the base metals.

**Substitutes:** Aluminum and rhodium can be substituted for silver in mirrors and other reflecting surfaces. Tantalum can be used in place of silver for surgical plates, pins, and sutures. Stainless steel is an alternate material used widely in the manufacture of table flatware. Nonsilver batteries being developed may replace silver batteries in some applications. Silverless black and white film, xerography, and film with reduced silver content are alternatives to some uses of silver in photography.

<sup>e</sup>Estimated. — Zero.

<sup>1</sup>One metric ton (1,000 kilograms) = 32,150.7 troy ounces.

<sup>2</sup>Refined bullion, plus silver content of ores, concentrates, precipitates, and doré; excludes coinage, waste, and scrap material.

<sup>3</sup>Handy & Harman quotations.

<sup>4</sup>Balance in U.S. Mint only.

<sup>5</sup>COMEX: Commodity Exchange Inc., New York. CBT: Chicago Board of Trade.

<sup>6</sup>Source: Mine Safety and Health Administration.

<sup>7</sup>Defined as imports - exports + adjustments for Government and industry stock changes.

<sup>8</sup>See Appendix B for definitions.

<sup>9</sup>Includes silver recoverable from base metal ores. See Appendix C for definitions.