

## SILVER

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

**Domestic Production and Use:** Approximately 1,200 tons of silver with an estimated value of over \$500 million were produced in the United States in 2007. Alaska continued as the country's leading silver-producing State, followed by Nevada; however, company production data are proprietary and were withheld. Domestic silver was produced as a byproduct from 36 base- and precious-metal mines. There were 21 refiners of commercial-grade silver, with an estimated total output of 3,000 tons from domestic and foreign ores and concentrates, and from old and new scrap. Silver's use categories include coins and medals, industrial applications, jewelry and silverware, and photography. The physical properties of silver include ductility, electrical conductivity, malleability, and reflectivity. The demand for silver in industrial applications continues to increase and includes use of silver in bandages for wound care, batteries, brazing and soldering, in cell phone covers to reduce the spread of bacteria, in clothing to minimize odor, in catalytic converters in automobiles, electronics and circuit boards, electroplating, hardening bearings, mirrors, solar cells, wood treatment to resist mold, and water purification. Silver was used for miniature antennas in Radio Frequency Identification Devices (RFIDs) that were used in passports and on packages to keep track of inventory shipments. Mercury and silver, the main components of dental amalgam, are biocides and their use in amalgam inhibits recurrent decay.

<b><u>Salient Statistics—United States:</u></b>	<b><u>2003</u></b>	<b><u>2004</u></b>	<b><u>2005</u></b>	<b><u>2006</u></b>	<b><u>2007<sup>e</sup></u></b>
Production:					
Mine	1,240	1,250	1,230	1,140	1,220
Refinery:					
Primary	2,580	1,140	2,530	3,150	2,500
Secondary (old scrap)	1,010	1,920	980	1,500	1,200
Imports for consumption <sup>2</sup>	4,510	4,100	4,540	4,820	4,570
Exports <sup>2</sup>	181	422	319	1,670	1,000
Consumption, apparent <sup>e</sup>	6,440	6,700	7,560	7,550	7,980
Price, dollars per troy ounce <sup>3</sup>	4.91	6.69	7.34	11.61	13.40
Stocks, yearend:					
Treasury Department <sup>4</sup>	220	220	220	220	220
COMEX, CBT <sup>5</sup>	3,430	3,580	3,750	4,000	3,290
Employment, mine and mill, <sup>6</sup> number	840	900	900	800	900
Net import reliance <sup>7</sup> as a percentage of apparent consumption <sup>e</sup>	65	54	54	38	55

**Recycling:** In 2007, approximately 1,600 tons of silver was recovered from old and new scrap. This includes 60 to 90 tons of silver that are reclaimed and recycled annually from photographic wastewater.

**Import Sources (2003-06):**<sup>2</sup> Mexico, 49%; Canada, 31%; Peru, 13%; Chile, 2%; and other, 5%.

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

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

**Government Stockpile:** All of the remaining silver in the National Defense Stockpile was transferred to the U.S. Mint by the Defense Logistics Agency for use in the manufacture of numismatic and bullion coins by yearend 2004. This transfer marked the end of silver requirements for the National Defense Stockpile.

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**Events, Trends, and Issues:** In 2007, silver prices averaged \$13.40 per troy ounce, surpassing 2006's average of \$11.61, and rising to the highest average annual price since 1980. Prices rose to \$15.47 in November 2007, which was more than 10% higher than the previous year's high of \$14.89 per troy ounce established in May 2006. The rise in silver prices corresponded to investment interest in the newly established silver exchange traded fund (ETF). The ETF was established in April 2006 and was modeled after the gold ETF that was started in 2003. Exports of silver rose dramatically in 2006 owing to movement of physical silver to the ETF inventory agency in London, United Kingdom. ETF inventories at the end of 2006 totaled 3,330 tons of silver and by the end of October 2007 had risen to 4,200 tons. The demand for silver also continued to rise for fabrication and industrial applications. The use of high-purity silver for color paper in home and other color printers offset the losses to digital photography owing to weak film sales. Overall, the photographic use of silver was relatively stable. Silver is still used in X-ray films, and 99% of the silver in photographic wastewater may be recovered. Use of silver to help regulate body heat and control odor in shoes and sports and everyday clothing is increasing. The use of trace amounts of silver in bandages for wound care and minor skin infections is also increasing. The deficit in world silver mine production as compared with world silver consumption was about 800 tons in 2007. Increased production at new and existing mines in North America and South America, such as at the San Cristobal Mine in Bolivia, coupled with lower flow of silver into the ETF inventory, is likely to bring production and consumption for silver in 2008 into closer balance.

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

	Mine production		Reserves <sup>8</sup>	Reserve base <sup>8</sup>
	2006	2007 <sup>e</sup>		
United States	1,140	1,220	25,000	80,000
Australia	1,727	2,000	31,000	37,000
Canada	980	1,200	16,000	35,000
Chile	1,600	1,400	NA	NA
China	2,600	2,700	26,000	120,000
Mexico	2,700	3,000	37,000	40,000
Peru	3,470	3,400	36,000	37,000
Poland	1,300	1,300	51,000	140,000
South Africa	87	90	NA	NA
Other countries	4,600	4,200	50,000	80,000
World total (rounded)	20,200	20,500	270,000	570,000

**World Resources:** Silver was obtained as a byproduct from processing and smelting copper, gold, and lead-zinc ores. These polymetallic deposits account for more than two-thirds of U.S. and world resources of silver. The remaining silver resources are associated with veins and submicroscopic gold deposits in which gold is the primary commodity. Most recent silver discoveries have been associated with gold occurrences; however, base-metal occurrences that contain byproduct silver will account for a significant share of future reserves and resources.

**Substitutes:** Silver was traditionally used in black-and-white as well as color printing applications; however, digital imaging, film with reduced silver content, silverless black-and-white film, and xerography may also be used. Surgical pins and plates may be made with tantalum and titanium in place of silver. Stainless steel may be substituted for silver flatware, and germanium added to silver flatware will make it tarnish resistant. Nonsilver batteries may replace silver batteries in some applications. Aluminum and rhodium may be used to replace silver that was traditionally used in mirrors and other reflecting surfaces.

<sup>e</sup>Estimated. NA Not available.

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

<sup>2</sup>Refined bullion, doré, and other unwrought silver; 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: U.S. Department of Labor, Mine Safety and Health Administration.

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

<sup>8</sup>Includes silver recoverable from base-metal ores. [See Appendix C for definitions.](#)