

SILVER

(Data in metric tons¹ of silver content unless otherwise noted)

Domestic Production and Use: In 2008, approximately 1,120 tons of silver with an estimated value of \$570 million was produced in the United States. Silver was produced as a byproduct from 31 base- and precious-metal mines. Alaska continued as the country's leading silver-producing State, followed by Nevada; however, company production data are proprietary and were withheld. 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 traditional 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 catalytic converters in automobiles, in cell phone covers to reduce the spread of bacteria, in clothing to minimize odor, electronics and circuit boards, electroplating, hardening bearings, inks, mirrors, solar cells, water purification, and wood treatment to resist mold. Silver was used for miniature antennas in Radio Frequency Identification Devices (RFIDs) that were used in casino chips, freeway toll transponders, gasoline speed purchase devices, 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.

<u>Salient Statistics—United States:</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008^e</u>
Production:					
Mine	1,250	1,230	1,140	1,260	1,120
Refinery:					
Primary	1,140	2,530	3,150	4,110	2,500
Secondary (old scrap)	1,920	980	1,500	1,540	1,550
Imports for consumption ²	4,100	4,540	4,820	4,980	4,550
Exports ²	422	319	1,670	780	520
Consumption, apparent ^e	6,700	7,560	7,550	6,880	6,740
Price, dollars per troy ounce ³	6.69	7.34	11.61	13.38	15.85
Stocks, yearend:					
Treasury Department ⁴	220	220	220	220	220
COMEX, CBT ⁵	3,580	3,750	4,000	4,125	4,090
Exchange Traded Fund ⁶	—	—	3,330	3,890	5,290
Employment, mine and mill, ⁷ number	900	900	900	900	850
Net import reliance ⁸ as a percentage of apparent consumption ^e	54	54	38	59	60

Recycling: In 2008, approximately 1,600 tons of silver was recovered from old and new scrap. This includes 60 to 90 tons of silver that is reclaimed and recycled annually from photographic wastewater.

Import Sources (2004-07):² Mexico, 50%; Canada, 31%; Peru, 13%; Chile, 2%; and other, 4%.

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 2008, silver prices averaged \$15.85 per troy ounce and rose to the highest average annual price since 1980. Prices rose to \$20.92 in March, which was more than 20% higher than the previous year's high of \$15.82 per troy ounce established in November 2007. The overall rise in silver prices corresponded to investment interest in several new silver exchange traded funds (ETF) that have opened since the first silver ETF was established in April 2006. At the end of 2007, silver ETF inventories totaled approximately 5,290 tons of silver and rose to more than 6,000 tons by July 2008. Consumption of silver also continued to rise for industrial applications. In the United States, demand for photography fell to 1,120 tons since peaking in 1999 at 2,290 tons. Silver is still used in x-ray films; however, many hospitals have begun to use digital systems. Approximately 99% of the silver in photographic wastewater may be recycled. Silver demand for industrial applications increased while demand for silver in photography, jewelry, silverware, and coins and metals decreased. Use of silver increased to help regulate body heat and to control odor in shoes and sports and everyday clothing. The use of trace amounts of silver in bandages for wound care and minor skin infections is also increasing. World silver mine production increased to 20,900 tons in response to increased production at new and existing polymetallic mines, such as Greens Creek in Alaska, the San Cristobal Mine in Bolivia, and the Uchucchacua Mine in Peru.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁹	Reserve base ⁹
	2007	2008 ^e		
United States	1,260	1,120	25,000	80,000
Australia	1,880	1,800	31,000	37,000
Canada	800	800	16,000	35,000
Chile	1,900	2,000	NA	NA
China	2,560	2,600	26,000	120,000
Mexico	3,000	3,000	37,000	40,000
Peru	3,500	3,600	36,000	37,000
Poland	1,200	1,300	51,000	140,000
South Africa	70	70	NA	NA
Other countries	4,630	4,600	50,000	80,000
World total (rounded)	20,800	20,900	270,000	570,000

World Resources: Silver was obtained as a byproduct from processing and smelting copper, gold, and lead-zinc ores. Ores from 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 continue to account for a significant share of future reserves and resources. Peru, Mexico, and China are the world's leading producers of silver, in descending order of production.

Substitutes: Digital imaging, film with reduced silver content, silverless black-and-white film, and xerography substitute for silver that has traditionally been used in black-and-white as well as color printing applications. 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. Silver may be used to replace more costly metals in catalytic converters for off-road vehicles.

^eEstimated. NA Not available. — Zero.

¹One metric ton (1,000 kilograms) = 32,150.7 troy ounces.

²Refined bullion, doré, and other unwrought silver; excludes coinage, waste, and scrap material.

³Handy & Harman quotations.

⁴Balance in U.S. Mint only.

⁵COMEX: Commodity Exchange Inc., New York. CBT: Chicago Board of Trade.

⁶Held in United Kingdom by ETF Securities and iShares Silver Trust and in Switzerland by Zürcher Kantonalbank.

⁷Source: U.S. Department of Labor, Mine Safety and Health Administration.

⁸Defined as imports – exports + adjustments for Government and industry stock changes.

⁹Includes silver recoverable from base-metal ores. [See Appendix C for definitions.](#)