

Silver News

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Pandemic Concerns Result in Strong Silver Investment Demand in 2020

Top 15 Primary Silver Producers (Moz)	2020
1 Fresnillo plc	50.3
2 Pan American Silver Corp.	17.3
3 Hecla Mining Company	13.5
4 Buenaventura	12.4
5 Industrias Peñoles	12.3
6 First Majestic Silver Corp.	11.6
7 Hochschild Mining plc	9.8
8 Coeur Mining, Inc.	9.7
9 Fortuna Silver Mines	7.1
10 Silvercorp Metals	5.9
11 Ag-Mining Investments*	5.8
12 Gatos Silver	4.2
13 Endeavour Silver Corp.	3.5
14 Silver Bear Resources	1.9
15 Sotkamo Silver	1.6
*Estimate	

Primary silver mines contributed 27 percent of total production last year, according to the *World Silver Survey, 2021*.

Silver-backed Exchange Traded Products (ETPs), increased almost threefold to 331 million ounces (Moz), surpassing 1 billion ounces of silver in 2020. Additionally, global physical silver investment (silver coin and bar purchases), grew 8 percent to 200.5 Moz, according to the *World Silver Survey 2021*, which was researched and produced by [Metals Focus](#), the precious metals consultancy on behalf of the Silver Institute.

Both of these factors led to the average annual silver price rising 27 percent from the previous year to US\$20.55, posting the highest annual average silver price since 2013.

Global silver demand dropped by 10 percent last year primarily as a result of the COVID-19 pandemic, which led to less industrial activity. However, the effects were not universal. While India was down 29 percent and Europe and China each were 8 percent lower, modest gains were seen in North America and Taiwan at plus 2 percent each, followed by a 1 percent increase in Japan. Photovoltaic demand grew 2 percent to 101 Moz last year, while brazing and alloy demand fell by 11 percent to 44.9 Moz. Electronics and electrical demand posted a 4 percent loss to 304.3 Moz, primarily due to weaker automotive production and a decline in consumer electronics demand. The pandemic restrictions caused the jewelry and silverware sectors to see declines of 26 percent and 48 percent, respectively, as retail stores and factories were forced to close.

Silver supply dipped in 2020, led by global mine production registering its fourth consecutive annual decline, its most significant drop of the last decade, falling by 5.9 percent to 784.4 Moz. Output from primary silver mines fell by 11.9 percent to 209.4 Moz, caused by temporary mine closures in several major silver-producing countries in the first half of 2020 due to the pandemic. Primary silver mines contributed 27 percent of total production last year.

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Higher silver prices led to a 7 percent increase in silver recycling to 182.1 Moz as scrap generated by industrial end-uses and jewelry and silverware rose last year. Primary silver mining total cash costs dropped by 5.7 percent to US\$4.73/oz, while all-in sustaining costs fell by 3.7 percent to US\$11.17/oz. Net hedging supply added 8.5 Moz in 2020, while official government sales of silver contributed 1.2 Moz.

The outlook for 2021 indicated that all segments of silver demand are expected to rise, offsetting the projected increase in mine production and silver scrap supply, the Survey noted. Silver is poised to benefit from its value as a precious metal as well as its uses as an industrial material as the world enters a post-COVID environment this year.

The *World Silver Survey 2021* can be downloaded from the Institute's website at www.silverinstitute.org.

Silver Composite Makes "ForeverPen" Possible

Are you always looking for a handy pen – and one that never runs out of ink?

Inventors of the ForeverPen make their writing instrument tip from a silver composite that, instead of leaving behind ink, or, in the case of a pencil, graphite, the ForeverPen oxidizes the writing surface and leaves a mark. The developers, who are seeking backers on [Kickstarter](https://www.kickstarter.com), say that the pen never runs out of its ability to write; in essence it will write forever.

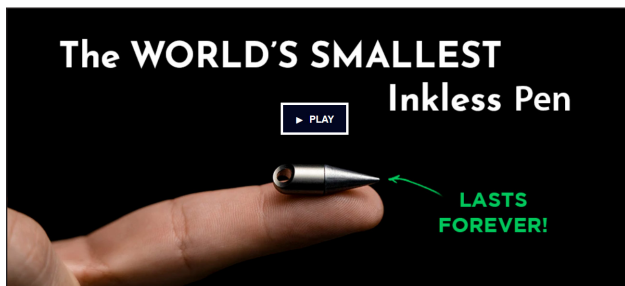
The pen is about an inch long, making it easy to carry on a keychain. The developers say that the propriety silver composite nib is based on a centuries-old drawing technique – 'silverpoint' – used during the Renaissance period and known to have been used by Leonardo da Vinci. Other artists who used the technique include Jan van Eyck, Albrecht Dürer and Raphael.

The nib writes smoothly and on almost any material, the developers say. It leaves behind grey marks similar to a regular graphite pencil writing on paper. Over time, exposed to air, the marks tarnish to a warm brown tone.

The nib will never wear down, never needs refilling, works underwater, needs no sharpening and can write in any position, even upside down. The rest of the pen, other than the silver tip, is either made of titanium, copper or brass, whichever the buyer prefers.

The sharpened tip can also double as a box opener.

The product will be available as soon as August for US\$34. The Kickstarter has already raised almost US\$380,000 even though the developers only sought US\$3,470.



Click the image for a video showing how the ForeverPen works.

Silver Brings Breakthrough in Flexible Body Sensors

When medical personnel place a round rubber sensor on a patient's skin – to measure heart or brain activity, for example – the disk has a little metal dot in the middle which carries electrical signals to the measuring device. Importantly, the little spot of metal must touch the skin at all times for the device to work. Sometimes, especially if the patient moves, it can become disconnected and measurements may become inaccurate.

What if the entire disk could be made to conduct electricity?

That's what researchers at [Carnegie Mellon University's Soft Machine Lab](https://www.cmu.edu) are working on.

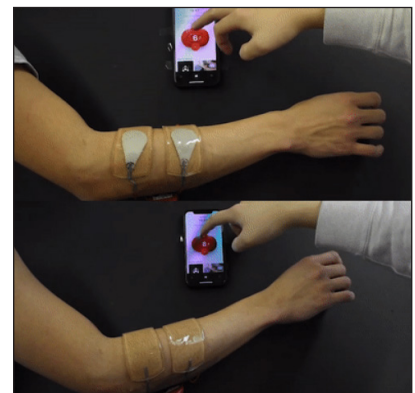
The substance they are using is called "hydrogel" which is a soft, flexible, lightweight and stretchable material that fits the contours of the body but is not electrically conductive – until the scientists infused it with silver particles.

Their findings, published in [Nature Electronics](https://www.nature.com), describe how they suspended micrometer-sized silver flakes, not as small as nanoparticles, into the hydrogel matrix which allowed the material to maintain its properties while adding electrical conductivity.

This process did not come easy, according to lab officials. Previous attempts only offered a trade-off between better electrical conductivity and flexibility. Now, however, they believe they have conquered the drawbacks.

"With its high electrical conductivity and high compliance or 'squishiness,' this new composite can have many applications in bioelectronics and beyond," explained Carmel Majidi, professor of mechanical engineering, in a public statement. "Examples include a sticker for the brain that has sensors for signal processing, a wearable energy generation device to power electronics, and stretchable displays."

Not only can the silver-infused disk be used to help measure electrical signals from patients, but it can also introduce electrical impulses to stimulate muscle movement. These stimulations currently are used to treat motor movement disorders such as Parkinson's disease or muscle ailments resulting from trauma or stroke.



Click the image to watch a video of how the silver-based sensor can stimulate muscles in the arm.

Silver Enhances Rapid Testing Method for COVID-19 Cases

By Trevor Keel, PhD., Technical Director,
The Silver Institute

Currently, the most accurate tests for COVID-19 are laboratory based, and generally require samples to be taken and sent away for analysis. Turnaround times can vary, and often are slow, especially during times of high demand, which can impact how virus surges are identified and dealt with by the authorities.

Silver may be able to help cut testing time while maintaining high accuracy.

Lateral Flow Assays (LFAs) – tests that detect a substance in a liquid sample without the need for specialized and costly equipment; home pregnancy tests are an example – have received a lot of attention over the last year as they have the potential to provide the rapid response needed to identify and combat COVID-19. While they are portable, easily deployed, and provide a diagnosis within 20 to 30 minutes, they are not as sensitive as laboratory testing tools. This could mean a higher likelihood that positive cases will be missed. These so-called ‘false-negatives’ could lead to individuals potentially and unknowingly spreading COVID-19 in their communities.

In an attempt to identify methods to improve the sensitivity of LFAs, a team of Japanese researchers has recently published a [paper](#) which details how silver enhances the readout of rapid testing tools. This technology has already been successfully developed as a point-of-care test for tuberculosis. The FujiLAM test, which was advanced by an international R&D consortium led by [FIND Diagnostics](#), continues to be studied and deployed around the world.

The technology works by amplifying the test results in a traditional LFA. After the LFA has been run, a small quantity of silver is added to the system which adheres to the gold nanoparticles in the test. This happens multiple times on each gold nanoparticle, physically increasing the size of the indicator particles a hundred-fold within a few seconds. This, in turn, increases the visual output signal, effectively offering a route to improve the overall sensitivity of the LFA.

The researchers coupled this technology with highly-specific antibodies and carried out a clinical study to compare performance against commercially available LFAs. They found that their silver-amplified technology performed better than standard COVID-19 LFAs, and, according to the company’s public statement, the test is now available in Europe after receiving [regulatory approval](#) in late March.

Silver Helps Detect Pesticides on Fruits and Vegetables

A multinational group of scientists has developed a flexible film based on silver nanoparticles that can be used to detect pesticides on agricultural products in minutes. It can even be used to identify pesticides on fruits and vegetables using a handheld device at the point of sale, such as in supermarkets.

To create the sensor, the researchers from Russia, Spain and Singapore combined melamine (a nitrogen-based compound used to create many products, especially plastic dishware) with silver nitrate. The mixing results in the formation of a white crystal powder, and when exposed to light the crystals decompose and produce a film of silver nanoparticles. This precipitation process takes about a day.

When a sliver of the film is applied to produce and dabbed with alcohol it gathers pesticide molecules which indicate by using a spectrometer – a device that identifies substances by the light they reflect – that pesticides are present.

In a prepared statement, Anastasia Nenashkina, head of the project and a Ph.D. student at Saint Petersburg’s [ITMO University](#), said: “We compared the detection threshold of our sensors with that of classical instruments... Our method is cheaper, quicker and more mobile. What’s more, there already exists portable and affordable devices that can be used to check the response of our films.”

The developers are seeking funding to further the commercialization of their invention.



A silver-based sensor can be used to test for pesticides on produce in food markets.

US Mint's Apollo 11 Silver Coin Wins *Coin of the Year* Award

The “2019 Apollo 11 50th Anniversary 5-Ounce Proof Silver Coin” from the [US Mint](#) won *Coin of the Year* for 2021. The coin also garnered awards for *Best Silver Coin* and *Best Contemporary Event Coin*.

The Coin of the Year Award, given by Krause Publications, publishers of [Numismatic News](#) and the *Standard Catalog of World Coins*, a series of numismatic catalogs, is considered a prestigious award among world mints. It was first given in 1984.

The 5-ounce silver coin is the first curved US coin of its type and is considered a technical achievement by US Mint officials.

The obverse side was conceived by artist Gary Cooper, whose design won a public competition. It features the inscriptions “MERCURY,” “GEMINI,” and “APOLLO,” separated by phases of the Moon, and a footprint on the lunar surface.

The reverse side represents the famous photo by astronaut Buzz Aldrin depicting his visor and part of his helmet. It also shows astronaut Neil Armstrong, the US flag and the lunar lander.

The reverse was designed and sculpted by Mint Artist Phebe Hemphill, in consultation with NASA.



THE ASTRONAUTS MEMORIAL FOUNDATION

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