



# SILVER

## wear



**more** THAN 2,000 YEARS AGO, HIPPOCRATES, known as the Father of Medicine, wrote about the medicinal powers of silver, noting its ability to heal wounds. The Phoenicians and other ancient people also lined containers with the metal, which killed bacteria and prevented water from spoiling. Flash forward a couple of millennia, and hospitals are using silver in a variety of applications, from bandages to bed sheets, to silver drops put into the eyes of newborn babies.



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For hikers, climbers, paddlers and anyone who is active, silver's great advantage is that it kills the bacteria produced when we sweat. To borrow a phrase from a silver-tongued philosopher (actually my old college roommate), the naturally occurring element is like "Deo for the BO."

While silver fabrics first made their way into outdoor apparel and clothing about five years ago, they've really started to shine the last couple of years. Once a fringe technology, more apparel and footwear manufacturers are using silver-based antimicrobials, while a greater number of silver fabric suppliers are entering the outdoor market. As consumer demand for odor-fighting clothing grows, the silver story could be a persuasive pitch on the retail sales floor.

The outdoor market has just begun to tap silver's potential, said David Whitley, business manager for Agion Technologies, which has provided

The outdoor market has **TAKEN A SHINE** to clothes with odor-fighting silver.

silver-based antimicrobials to brands in the outdoor market, such as Timberland, DuPont and adidas. Whitley said companies are seeking natural and durable antimicrobial technologies that serve as alternatives to chemical treatments. "It's a market need that has not been fully addressed yet," he said, "and we're just getting into (silver antimicrobials) in any kind of size."

The producers of silver-based antimicrobials say the technology will flourish as consumers come to expect clothes that inhibit odor, just as they now expect garments that wick moisture. "Look at casual apparel in department stores, and you're starting to see phrases like 'mitigates odor.' Consumers recognize this, and it's an attribute they're coming to expect," Whitley said.

We'd argue that outdoor customers aren't quite clamoring for odor-fighting clothes, but the demand will likely increase, and more product stories will have a silver lining.

### A FEW SHINING EXAMPLES

At the 2006 Outdoor Retailer Winter Market trade show in Salt Lake City, there were 23 brands on the show floor that incorporated the X-Static brand of silver fiber. At the show, we found silver fibers in apparel, socks, shoes and even insoles, and took note of the silver trend in a February SNEWS® report (go to [www.snewsnet.com](http://www.snewsnet.com) to read, "Outdoor Retailer Winter Market '06 Trends: Base layers").

This year, InSport expanded its Xodus line of X-Static clothing to include long sleeve and short sleeve T-shirts, long johns, briefs, boxers, a skullcap and even a thong.

Even the most core outdoor companies have embraced silver, and Mountain Hardwear's new Extend Mid-weight Zip T (\$55) is made with Milliken's Visa Endurance antimicrobial fabric.

While most apparel brands utilize silver fabrics to fight odor, Wigwam Mills' new X-Static Medical and X-Static Lightweight Medical socks are designed for people with

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diabetes and other foot problems such as neuropathy (a nerve disorder).

While X-Static and Visa Endurance have been in the market a few years, we also saw new silver antimicrobial technologies introduced recently, including Hot Chillys Bio-Silver nylon. Not only is Bio-Silver in standard base layer tops and bottoms, but Hot Chillys has also added it to more intimate fare like bras, camisoles and boy shorts.

Another new antimicrobial called Silpure was unveiled in late 2005. Sometimes sold under the name Ultra Fresh, Silpure is a product of Thomson Research Associates, a 51-year-old Canadian company in Toronto, Ontario, that produces all sorts of antimicrobials, including ones that use chemicals, such as triclosan. "We wanted to develop a product you can use in a broad range and replaces triclosan," said Glenn Runciman, director of sales for Thomson. While triclosan is effective (it's the main ingredient in many soaps and deodorants), some of Thomson's customers want a natural alternative to chemical antimicrobials.

Runciman said that silver antimicrobials first emerged in the 1980s, but Thomson didn't produce its own version due to high cost. But new manufacturing

happened with silver in the outdoor market. Though Visa Endurance first arrived four years ago in Terramar products, Milliken really started a serious marketing campaign for it in 2004. "That's when it really started to take off," Murajda said. "We've added a lot of new customers, not only in the outdoor market, but in hunting and fishing." In addition to Mountain Hardware, it supplies Under Armour, Dillard's (for a private-label product) and Bass Pro Shops.

About the same time Visa Endurance began its marketing campaign, U.S. sales also jumped for X-Static, perhaps the most recognized silver fiber. Introduced by Noble Fiber Technologies in Scranton, Penn., five years ago, X-Static is now used by 50 outdoor brands globally. Joel Fuery, president of the Noble Fiber Technologies consumer division, which supplies the outdoor industry, said X-Static's business has grown 75 percent to 100 percent a year for the past five years, but the U.S. sales have really picked up in the last couple of years.

X-Static not only has a consumer division, but also a medical division that partners with Johnson & Johnson to make

still not aware of silver antimicrobials. In fact, many shops say that customers appreciate anti-odor clothing, but they're not yet asking for it specifically.

Wes O'Neal, outdoor shop manager for Sunflower Outdoor & Bike Shop in Lawrence, Kan., said he sells plenty of socks with X-Static and Mountain Hardware Extend shirts, but customers rarely ask for odor-fighting products. "We do tell them about what the silver does," O'Neal said, noting that it's a helpful part of the general sales pitch.

James Sloan of High Country Outfitters in Atlanta agrees that few customers are clued in about antimicrobials. "But that's something we tell people about, as far as describing the differences between underwear. And they'll lean toward the ones that have it," he said.

On the other hand, Neptune Mountaineering in Boulder, Colo., isn't bringing in any synthetic clothes with odor-fighting treatments. "We're seeing a significant increase in our wool base layer business, and that is partially driven by one of the chief benefits of wool—that it doesn't take on odor," said Mary Michaels, buyer for Neptune Mountaineering.



As consumer demand for odor-fighting clothing grows, the silver story could be a **PERSUASIVE PITCH** on the retail sales floor.

techniques that require smaller amounts of silver have made it more affordable. "Silpure allows you to sprinkle fine particles of silver over a fabric or fiber, rather than using inefficient lumps," said Runciman. Also, companies have found ways to make smaller amounts of silver more efficient and durable.

Agion encases silver ions in a ceramic powder called zeolite. When salt from sweat touches the ceramic grains, the silver ions become charged and kill microbes. Jeff Trigolo, chief technology officer for Agion, said that it only takes a small amount of silver to kill bacteria, and the ceramic delivery system does out the ions in small amounts only when needed.

Milliken's Visa Endurance product, introduced to the market in 2002, also encases silver in a ceramic cage bonded to a fabric surface, which prevents silver from shedding. Lyn Murajda, a division brand manager for Milliken's apparel and specialty fabrics division, said that this makes the silver antimicrobial last longer than a chemical treatment that can wash out relatively quickly.

If you track the growth of Visa Endurance, you get a good idea of what's

bandages, an industrial division that services the electronics market, and a military division that supplies six pairs of X-Static socks to every U.S. Army soldier.

One thing interesting about X-Static is that its growth hasn't been slowed by the fact that it's one of the most expensive silver antimicrobial technologies on the market. Compared to other products, X-Static uses a greater amount of silver to coat entire fibers, so it carries a higher price tag. But, Fuery said, X-Static offers a higher level of performance that's required in the medical industry. "We've stuck to a high standard that is too expensive for a lot of brands and companies," he said.

While X-Static tends to work with high-end brands, Whitley of Agion said that less expensive technologies might allow the silver concept to spread more rapidly through a wider range of markets. And the silver fiber producers we spoke with said they try to keep from passing costs along to the consumer. Nevertheless, a silver-based shirt can cost the consumer about \$10 more than a synthetic shirt without the technology. Retailers may need to explain to customers the reason for the higher price, and keep in mind that most consumers are

Apparently, the champions of silver still need to win some hearts and minds in the outdoor market. But, they do have one thing on their side—right now there's an antibacterial craze sweeping the consumer products market.

### CLEAN CRAZE, CLEAN CONCERN

Roll your shopping cart down the aisles of pretty much any grocery store and you'll pass dozens of products that claim to kill bacteria and microbes. "In the early to mid-90s, we started seeing an influx of antimicrobial and antibacterial products," said Stuart Levy, Ph.D., a professor in the Tufts University department of microbiology. "It was sparked to some extent by all the news about emerging infections, and people began to think, 'We better take care of ourselves.' But what really did it were the marketing people." Once the product marketers began to highlight the antibacterial properties and jazzed up their packaging, the trend really took off. "The first was the soaps," said Levy. "Once the antibacterial label was put on, they became much more sought-after—they became market winners."

Levy and other scientists have been

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concerned for years that the flood of antibacterial products might contribute to the development of resistant strains of bacteria, or “super bugs.” Experts argue over the notion that antimicrobial products contribute to the problem, and no one can say for sure whether bacteria could become resistant to silver.

“Theoretically, something could become resistant to silver,” said X-Static’s Fuery. “But the common thinking in the marketplace and medical community is it won’t, because it’s been around forever. Bacteria generally become resistant within a 20- to 50-year timeline.”

In March, the Centers for Disease Control and Prevention published the results of a study that examined whether household antibacterial cleaning and hygiene products could create drug-resistant bacteria on users’ hands. The study concluded: “Antibacterial product use did not lead to a significant increase in antimicrobial drug resistance after 1 year...nor did it have an effect on bacterial susceptibility to triclosan. However, more extensive and longer term use of triclosan might provide a suitable environment for emergence of resistant species. Further research on this issue is needed.”

In a statement sent to GearTrends®, Patagonia said, “Silver mining and refining is environmentally damaging.” It also said that silver from discarded fabrics could leach into groundwater and waterways. “Or when silver gets into wastewater through home laundering, it may be absorbed or ingested by algae and small fish,” Patagonia stated.

In the late 90s, environmental expert Eric Wilmanns worked for Patagonia and researched the prospect of using silver as an antimicrobial. He suggested that the concern over extraction techniques could be justified. “Silver mining is usually open-pit or strip mining, and extensive chemical processes are used to process the silver,” he said. “Environmental regulations in countries other than Europe and North America are suspect. And one problem is that the supply chain is so diluted, it’s hard to tell where silver is coming from.”

Silver fiber producers counter that the element is used widely throughout the world, and the extraction to supply their products makes a very small impact in the grand scheme of things. “A pair of X-Static socks has only 0.01 ounces of silver,” said Fuery.

As for the threat to groundwater and wastewater, Murajda said that Milliken’s manufacturing is a closed-loop process so, at that stage, silver isn’t deposited into the

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environment. "U.S. manufacturing regulations are so strict that (water contamination) is not an issue," she said. In addition, Murajda said that a full washing machine load of Visa Endurance shirts would discharge less silver into the water system than the amount released when you wash silverware in the sink or dishwasher.

Beyond its environmental concerns, Patagonia's other beef with silver is that it simply didn't perform well during its own company field tests. The SNEWS® and GearTrends® editorial team has casually tested several socks and shirts that include silver, and they generally kept the stink factor to a minimum. Or would there have been stink without it? One of our testers completely sweated out an X-Static shirt, and then chucked it into the back of his truck, where it cooked in 90-degree heat for three days. Afterward, the shirt gave off only a mild odor, so it appears to us that the technology worked in this instance. Or, maybe we just don't stink as much.

Naturally, not everyone has the same body chemistry, so products may work better for certain people. Also, Murajda said that some people have noses that are more sensitive. "I have a very sensitive nose and can smell things very sharply, but my son—when we pass a dead skunk on the side of the road—he thinks it smells like lemons." She said her best testimonial came from a New Hampshire couple who hiked in Thailand, India and Sri Lanka for 10 weeks. "The husband used to have to change his shirt twice a day, and he didn't have to with our product," she said.

Can silver win over the masses, as it did the folks from New Hampshire? The jury's still out, but silver shouldn't be a tough sell. The element enjoys a favorable reputation, and it's present in the lives of many people. After all, we trust its use in our finest flatware.

Though silver's presence in the outdoor market has primarily been in apparel and footwear, we can envision that it might be used in other types of gear, such as hydration systems. There's a saying that history repeats itself, and wouldn't it be something if the very element that preserved water in vessels thousands of years ago made its way into water containers of the 21st century.

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