
SILVER NEWS

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Silver Featured in Healthcare Fabric Award

By Samuel Etris, Senior Technical Advisor
to The Silver Institute

The [CF Stinson Company](#) of Rochester Hills, Michigan, has produced silver-containing antibacterial upholstery fabrics designed for travel seats that prevent the spread of bacteria among travelers.

The company's 'Now & Zen' Fabric collection won the *Gold Award for Healthcare Fabrics* for its woven upholstery fabrics at NeoCon's June 2009 trade show in Chicago. NeoCon is the world's largest commercial interior trade organization and holds a juried competition at their annual trade show.

The fabrics contain silver/zinc crystal zeolites supplied by [Agion Technologies](#) of Wakefield, Massachusetts, a leader in providing anti-microbial solutions based on silver. These crystals contain 2.5 percent silver ions to destroy bacteria and 14 percent zinc ions to inhibit the growth of mold nutrients. The slightest moisture on these textiles releases the silver ions to exert their antibacterial and sanitation action.

Agion Technologies developed the silver/zinc zeolite crystal for its adherence to textiles so as to provide a continuous release of bactericidal silver ions. Studies conducted by the University of Arizona with the zeolite crystals showed marked reductions in populations of Salmonella, E. coli, Listeria, Legionella, and S. Aureus within a few minutes and elimination within three hours of contact.

The effectiveness of silver/zinc containing zeolite crystals that inhibit the growth of bacteria on steel has also resulted in significantly increased production of coated steel by AK Steel, Middletown, Ohio. The company first produced the coated steel in 2003 and now produces over 1000 tons per year.

A study involving Agion crystals conducted at the Department of Microbiology and Immunology at the University of Arizona in Tucson showed that when 87,000 units of Staphylococcus aureus were incubated on silver/zinc coated stainless steel panels under normal room conditions, their number was reduced to 1,500 units within one hour, and to almost zero within 24 hours. The same amount of toxin placed on untreated steel panels exposed to air showed that 2,200 units remained fully active after 24 hours. In a second test, the silver/zinc zeolite-coated steel was inoculated with 390,000 Staphylococcus aureus units, but only 240 units survived after one hour, and within 24 hours less than ten units survived. On the other hand, 390,000 Staphylococcus aureus units placed on untreated stainless steel found 180,000 units surviving after one hour, and 2,800 units after 24 hours, leaving sufficient numbers to proliferate without any means of control.



Silver-imbedded fabrics used in travel seats for airplanes, trains and other public vehicles can help inhibit the buildup of bacteria and other pathogens.

The 8th China International Silver Conference

The China International Silver Conference (CISC) is accepting registrations for this year's conference to be held at the Huatian Hotel in Chenzhou, Hunan Province, China from October 21-23, 2009. The China Chamber of Commerce of Metals, Minerals & Chemicals Importers and Exporters (CCCMC) are the principal organizers of the conference.

The Conference begins on Wednesday, October 21 with a welcome dinner. A full day of speakers on a variety of silver topics is slated for the 22nd, and the 23rd is reserved for speeches and a field trip to nearby Yongxing County, China's Silver Capital, where delegates will see the region's silver refining operations, silver jewelry and artifact manufacturing, and the retail outlets that service the region.

The website for the CISC can be found at: <http://silver2009.antaike.com/en/>

Travelers to Chenzhou can fly to Beijing, Shanghai, or Guangzhou. From Beijing or Shanghai, you must connect to Changsha, or if possible, take a direct flight into Guangzhou. Chenzhou is not accessible by air, but can be reached by a three-hour car ride from Changsha or Guangzhou. Transportation for foreign delegates to Chenzhou from either Changsha or Guangzhou will be provided free by the organizers.

Chenzhou city has 4.6 million people and is located in the southeast part of Hunan Province. It traces its history over 2200 years to the Qin Dynasty.

For more information on the CISC, please contact the Silver Institute at 202-835-0185.

Update on Silver Marketing Initiative

Late in 2008, The Silver Institute kicked off the Silver Marketing Initiative (SMI) whose primary objective is to enhance the image of and stimulate demand for silver jewelry, initially focusing on the United States.

The following 10 designer/branded lines were chosen for the launch of the SMI:

- | | |
|---------------------|------------------|
| - Elle | - Robin Rotenier |
| - Lagos | - Scott Kay |
| - Leslie Greene | - Slane & Slane |
| - Paz Collective | - Thistle & Bee |
| - Robert Lee Morris | - Zina |

The culmination of Phase I occurred on December 3, 2008 in New York where about 100 people attended a gala including many of the inaugural 'Designers of Distinction.' Event highlights included the introduction of the new SilverMark, the brand platform line, SavorSilver, and a preview video of the SavorSilver website. Media coverage included an article in the *International Herald Tribune* and an article in *National Jeweler* under the headline "Silver's Back – and so is its marketing apparatus."

Objectives for this year are the expansion and refinement of the programs initially introduced in 2008 and the identification and prioritization of new, complementary programs designed to maximize SMI's impact. Programs implemented in the first half of 2009 included the fielding of a retail-focused research project to further quantify the success of silver jewelry during the 2008 holiday season and its ongoing momentum. The positive results were communicated to the industry in press releases and at trade shows.

The SMI participated in the three primary US jewelry trade shows: the MJSA Show held at Javits in March; the JCK Show in Las Vegas in late May; and the JA Show, also at Javits, in late July.

Recent highlights include the addition of 8 new 'Designers of Distinction' who will be integrated into an expanded SavorSilver website this fall. Additionally, the SMI made an on-air award presentation to silver designer Robert Lee Morris on the QVC cable channel in August. The award was given in conjunction with the 24 hour Sterling Designer Gallery broadcast.

A five-part series detailing the SMI was recently prepared to run in *Jewelry News Asia's Show Daily* in conjunction with the Hong Kong Jewelry and Watch Fair. This fall, SMI will be making a presentation at a major silver event in Zacatecas, Mexico and plans are underway to expand the SMI to Mexico and Peru in 2010.



SilverMark

Nanosilver May be Better for Burns Than Ionic Silver, Say Researchers

Scientists are reporting that nanosilver may be better for burn treatment than traditional silver ion-based products such as those using silver sulfadiazine and silver nitrate.

Indian researchers using a gel, which has imbedded silver particles from 7 to 20 nanometers synthesized by a proprietary biostabilization process, found that it killed a broad range of bacteria including *Pseudomonas aeruginosa*, one of the most common causes of burn infections. The gel, which contains 30 times less silver than silver sulfadiazine, did not have any apparent toxic effects when applied to the healthy skin of test animals.

Although ionic silver is used effectively for burns and wounds, it can sometimes be neutralized by biological fluids. Long term use may cause the skin to turn a blue or bluish-grey color, a non-life threatening condition known as argyria. In some cases, too much silver can injure fibroblasts or 'healing cells.'

Writing in *Molecular Pharmaceutics*, a journal of the American Chemical Society, Kishore Paknikar, Ph.D. of the Centre for Nanobioscience, Agharkar Research Institute in Pune, India, wrote: "Our study offers an unequivocal proof that silver nanoparticles work as a potent antimicrobial agent at low concentrations. In vitro and in vivo experiments established the safety of silver nanoparticles as well as its formulation (silver in gel). The latter could be an effective and safer alternative to conventional topical antimicrobial agents, especially for treating burn wounds."

The author also cited recent experiments by other researchers showing the efficacy and safety of silver nanoparticles for wound and burn treatment.

In a presentation in August at the American Chemical Society's National Meeting and Exposition held in Washington, D.C., Ankit Agarwal, Ph.D. of the University of Wisconsin in Madison reported that nano-thin polymer films with silver nanoparticles may deliver the precise amount of silver needed to kill bacteria while avoiding any tissue damage. A test on mouse cells and sample bacteria used silver dosages that were 0.4 percent of those used in commercial silver dressings. Researchers report that the dosage killed 99.9999 percent of the bacteria without damaging wound-repairing fibroblasts. They also found that the system was so sensitive that increasing the dosage to 1 percent of that used in commercial dressings severely damaged the fibroblasts.

Silver Can Reduce Bacteria in Nursing Homes

High levels of deadly bacteria in nursing homes can be dramatically reduced by using products treated with silver antimicrobial agents, according to a study published in a recent issue of the *British Journal of Community Nursing*, a peer-reviewed journal.

The study included data from a refurbished nursing home in Leicester, UK. One residence was refitted with a range of silver antimicrobial treated products while the other, the control, was not. Both units were occupied by single, long-term residents and all products in the trial were cleaned according to the same regime. This assured that any levels of decontamination achieved by the antimicrobial products occurred in addition to the effect of normal cleaning.

During a five-month period, swabs were collected from treated and untreated surfaces located in the bedroom and bathroom of each residence and cultured for bacteria counts. Results showed that the average difference in bacterial counts between all treated products in the first unit and all untreated products in the control unit ranged from 23 percent for light switches and electrical sockets to 99 percent for beds, bins and molded sheet tiles. The average difference in bacterial counts was 94.8 percent. "By investing in peer-reviewed and published studies, we're committed to leading and informing the debate around infection prevention and ensuring that healthcare providers have the information they need to make informed and safe decisions," said Richard Hastings, a microbiologist at [BioCote, Ltd.](#) which helped fund the study. "Products with antimicrobial protection are not the ultimate answer to eliminating bacteria; however, this evidence suggests that they can be part of infection prevention and control strategies, complementing cleaning to reduce the risks of cross-contamination and consequential infection . . . This study shows that bacterial contamination can be reduced by 95 percent simply by using antimicrobial protected products within the nursing home."

Companies and Organizations Outfitting Workers With Silver-Based Masks to Ward Off Flu

Employees and their families of Nova Scotia-based Carroll Automotive Group dealerships were given silver-imbudded antimicrobial masks to help prevent the spread of the H1N1 Flu and other contagious diseases.

Canadian health officials approved the respirator masks manufactured by [Nexera Medical](#) which, unlike most simple respirator masks, contain silver. Shortly after H1N1 had been found in Mexico, the auto company bought six masks each for 145 employees and their families. In all, they purchased 3,000 masks which can be reused for 28 days in the event that government officials declare a medical emergency.

According to Nexera Medical, silver and copper particles are imbedded into the SpectraShield Antimicrobial Respirator Mask fabric fibers through a patented technology. The silver and copper both prevent the buildup of bacteria on the inside and outside of the mask. Tests have shown that the mask can kill and inhibit the growth of a wide range of bacteria, viruses, and fungi, including Influenza A (which includes H1N1), Avian (Bird) Flu, MRSA, Tuberculosis, Streptococcus, staph infections, SARS, and other harmful and deadly bacteria and viruses.

The unique dual filtration and antimicrobial characteristics of the mask not only protects users from becoming infected but also helps to shield the general public from being exposed to a disease by an infected user. Additionally, unlike most masks available today that may need to be replaced and disposed of every three to five hours, the SpectraShield is fully functional and can be reused for up to 28 days.

The Pan American Health Organization purchased similar masks for their field officers in Mexico and Panama who are responding to the H1N1 outbreak. Nexera donated additional masks to the effort as well.



SPECTRA

Carroll Automotive Group gave employees and their families masks infused with silver and copper to help prevent the spread of the H1N1 flu.

Use of Metallic Silver as an Oxygen Transfer Agent

By Jeffrey Ellis, Senior Technical Consultant to The Silver Institute

The Silver Institute is researching ways to expand the uses of silver as an oxygen transfer agent. Silver has long been known to absorb and give off oxygen without reacting with the gas. Silver bullion can absorb 200 parts per million by weight of oxygen.

The main purpose of this research is to learn if colloidal silver and nanosilver particles can also be used as recyclable catalysts for oxidation reactions. The high surface areas of these particles, and the ability to use water-based systems, indicate that these will be efficient transfer media and environmentally benign.

Companies exploiting silver/oxygen chemistry and academic research groups interested in catalysis and other uses of silver are being contacted to stimulate further research into potential commercial applications.

Silver/oxygen chemistry is already used in chemical process industries to manufacture formaldehyde and ethylene oxide. Other uses include water treatment and antimicrobial applications. Silver is also being utilized by NASA to modulate atmospheres in spacecraft.

Silver Nanotechnology Working Group: A Progress Report

By Rosalind Volpe, Executive Director, SNWG

The Silver Nanotechnology Working Group (SNWG), headquartered in Research Triangle Park, North Carolina, was formed by the Silver Institute and the Silver Research Consortium in January, 2009. The SNWG is an industry effort to foster the collection of data on silver nanotechnology in order to advance the science and public understanding of the beneficial uses of silver nanoparticles in a wide-range of consumer and industrial products.

The formation of the group was in direct response to challenges companies face in registering new products containing silver nanoparticles, and to counter misleading or inaccurate statements regarding the potential environmental and health effects of silver nanoparticles.

The SNWG currently has five member companies: Servicios Industriales Penoles S.A. de C.V., Bayer MaterialScience, LLC, NanoHorizons, Inc., and BYK Chemie and HeiQ Materials, AG., who joined as initial members. The SNWG allows industry participants to share environmental and human health information on their respective nanosilver products and processes, including research, findings, and other data. This aggregated information can then be used by individual SNWG members for registering their own nanosilver products with regulatory agencies, providing technical assistance for ongoing federal programs in nanotechnology.

The SNWG members have been meeting with the US Environmental Protection Agency (EPA) throughout 2009 and have submitted data (study protocols, nanomaterial stewardship program forms, and targeted literature) on silver nanoparticles to the EPA on a continuing basis. The American Chemical Council has invited the SNWG to present a case study on silver nanoparticles at the OECD (Organization for Economic Co-operation and Development) Risk Assessment Workshop in Washington, DC, in September. The SNWG is now a member of the USCIB (United States Council on International Business) and will have access to the OECD/BIAC (Business and Industry Advisory Committee) silver nanotechnology committees.

The SNWG will continue an ongoing dialogue with EPA and other regulatory agencies in 2009-2010 and prepare further submission of aggregated data to increase EPA's understanding as well as the public's understanding of the function of nanosilver in products, and its interaction with the environment and health.

SNWG hopes to increase its membership, gain a global perspective and participate in EPA and OECD activities during 2009 and 2010.

Silver Imbedded Fiberboard Offers Anti-Bacterial Protection

Cardiff, Wales-based [AgTech](#) has produced silver-based Medium Density Fiberboard (MDF), in partnership with DuPont, that it says kills bacteria and fungi on contact.

MDF is similar to plywood but made from individual wood fibers and not veneers, making it stronger than particle board.

The company's founder, Peter Greening, had worked in the construction industry and was recovering in the hospital from an industrial accident when he came up with the idea for the anti-bacterial building material. He found the silver powder coating at Du Pont and, after obtaining a license, began baking it onto the MDF.

According to the company, three accredited testing laboratories confirmed that the fiberboards produced a 99.9 percent germ kill rate, with the majority of germs killed within the first 30 minutes of contact. The fiberboard does not need any maintenance and only requires cleaning with soap and water. The company's goal is for area hospitals to employ the fiberboard, as well as schools, restaurants, nursing homes and nurseries.



Silver imbedded in Medium Density Fiberboard (MDF) is not only similar in strength to plywood but can ward off bacteria from walls and furniture.

EPA Okays Silver-Citric Acid Cleaner for Food Areas

The US Environmental Protection Agency (EPA) has issued a final ruling that exempts cleaning solutions containing concentrations of silver ions not exceeding 50 parts per million – stabilized in citric acid – used to sanitize food preparation or eating surfaces. The EPA has limited this exemption to silver ions produced by electrolysis and mixed into citric acid or silver hydrogen citrate.

The ruling is quite specific. Other silver-containing compounds are not included in this ruling, such as silver salts, compounds with inorganic polymers such as zeolites and metallic silver in any form, including nanosilver.

In its ruling, the EPA noted that any possible silver toxicity has been well studied over centuries, and the only adverse effect of ingesting too much silver appears to cosmetic – which it would still like to prevent by setting an upper limit. It noted: “Safe exposure levels for silver have been established by several regulatory Agencies including the Food and Drug Administration, Occupational Safety and Health Administration and offices within the EPA based on the common endpoint argyria and using the same human studies. Argyria is a blue-gray discoloration of the skin and is not considered as being of toxicological concern. Argyria is cosmetically disfiguring and permanent in nature; however, the occurrence of this condition does not adversely affect organ function or threaten human health. EPA believes that by regulating for argyria, it is protecting the public from this permanent cosmetic effect as well as any potential toxic manifestations of silver that may occur at much higher doses.”

The EPA ruling restricts the silver ion-citric acid cleaning fluid – which can administered by spraying, wiping or full immersion - to food preparation surfaces and food processing equipment and requires that it carry a label prohibiting its use on dishes, utensils and glassware “until a residue transfer study has been conducted and accepted by the Agency.”

The ruling can be read here: <http://www.epa.gov/EPA-PEST/2009/June/Day-10/p13476.htm>

For Future Reference Silver Prices 1980-2009

2009	High	Low	Average
August	14.98	13.87	14.40
July	13.99	12.64	13.38
June	15.95	13.57	14.62
May	15.60	12.48	14.11
Apr	13.02	11.79	12.50
Mar	13.86	11.95	13.09
Feb	14.49	12.30	13.41
Jan	12.56	10.42	11.39

2008	High	Low	Average
Dec	11.39	9.35	10.32
Nov	10.46	8.80	9.78
Oct	12.72	8.79	10.39
Sep	13.46	10.46	12.22
Aug	17.48	12.80	14.48
July	19.18	17.25	18.07
June	17.62	16.46	17.01
May	18.24	16.12	17.01
Apr	18.31	16.50	17.48
Mar	20.69	16.81	19.16
Feb	19.81	16.30	17.66
Jan	16.95	15.17	16.05

Year	High	Low	Average
2008	20.69	8.79	14.97
2007	15.50	11.47	13.38
2006	14.85	8.82	11.62
2005	9.00	6.43	7.32
2004	8.21	5.51	6.67
2003	5.98	4.35	4.89
2002	5.11	4.22	4.60
2001	4.81	4.03	4.36
2000	5.55	4.56	4.97
1999	5.76	4.87	5.22
1998	7.26	4.62	5.51
1997	6.34	4.16	4.88
1996	5.82	4.68	5.18
1995	6.10	4.38	5.19
1994	5.78	4.57	5.28
1993	5.44	3.52	4.30
1992	4.32	3.63	3.94
1991	4.55	3.51	4.03
1990	5.35	3.94	4.82
1989	6.20	5.02	5.47
1988	8.06	6.01	6.53
1987	11.25	5.35	6.99
1986	6.32	4.85	5.49
1985	6.89	5.48	6.14
1984	10.17	6.25	8.15
1983	14.74	8.38	11.46
1982	11.30	4.81	7.93
1981	16.53	7.97	10.53
1980	50.35	10.20	20.66

(COMEX settle)

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