

# SILVER

A Study of this Precious Metal and its Use in Foot Care

**LEARN THE SECRETS THAT MAN HAS KNOWN FOR CENTURIES ABOUT PROTECTING THEMSELVES FROM THEIR ENVIRONMENT AND WHAT DOCTORS ARE REDISCOVERING TODAY.**

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# Silver:

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## Introduction

### **Footdefense.com would like to know:**

- Do you suffer from Athlete's Foot?
- Are you a diabetic concerned about your feet, or have a loved one that you are concerned about?
- Do you suffer from swelling in your legs or knee, back, and arch pain?

What you are about to read is not "new science". The information has been with us since before the dawn of civilization. The ancient Babylonians, the Egyptians, the Greeks and Romans all knew the powers of silver.

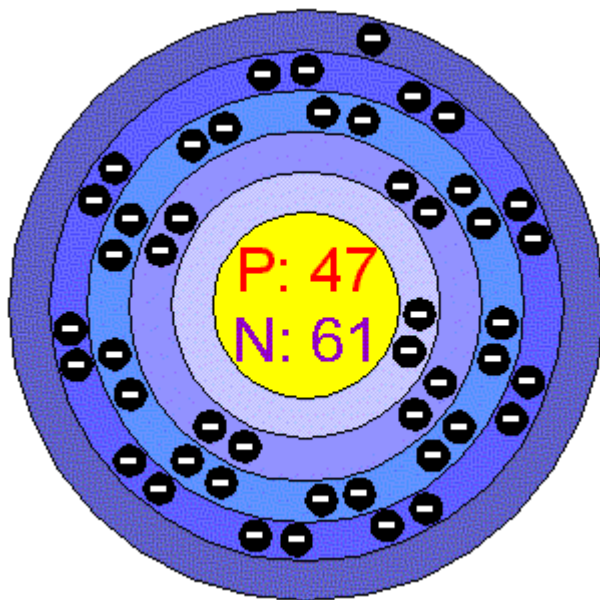
But what is big deal about this metal and how can it help you with your feet? In the following pages you are about to re-discover the ancient mysteries of silver. All of the information is backed by centuries of data, testing, and practical use. You will learn why silver is truly a "precious metal".

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## What is Silver?

Silver is a chemical element on the periodic table that has the symbol of Ag (from the traditional abbreviation from the Latin, *Argentum*). It is a soft, white lustrous transition metal; silver has the highest electrical and thermal conductivity of any metal. [Source: [en.wikipedia.org](http://en.wikipedia.org)]



# Ag

<b>Name:</b> Silver
<b>Symbol:</b> Ag
<b>Atomic Number:</b> 47
<b>Atomic Mass:</b> 107.8682 amu
<b>Melting Point:</b> 961.93 °C (1235.08 °K, 1763.474 °F)
<b>Boiling Point:</b> 2212.0 °C (2485.15 °K, 4013.6 °F)
<b>Number of Protons/Electrons:</b> 47
<b>Number of Neutrons:</b> 61

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## The History of Silver

Silver has been known longer than recorded history. It is believed Silver first came about in the region that is now Turkey. This was mastered around 3000 B.C. Here it is found in the royal tombs of ancient Ur where it was extracted from a lead ore, known as



3<sup>rd</sup> Millennium B.C. Carving of King holding a silver statue. –Anatolian Plain in modern-day Turkey.

*galena*, through a process known as smelting. Its discovery was probably by accident, since these ancient people of Asia Minor used lead in many of their household items and tools.

The use of silver for its medical and therapeutic benefits dates back several thousand years.



Early mining site found in Egypt. The date is unknown but it is estimated that this area was mined around the first century A.D. Smelting is the typical method for early peoples to extract silver from the raw ore.

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The Persian emperor Cyrus the Great, in the 5<sup>th</sup> century B.C., is best known for his creating the Persian empire from the tribes of people which is now known as Iran. His armies were vast and he conquered due to advancing technologies of war and medicine.



Cyrus the Great, ruled Persia from 580-529 B.C. In that time he brought the knowledge of silver with its great healing properties to the world.

One of these advancements that made Cyrus “great” was that he would only let his troops go to war if they carried water in silver vessels—something he knew would keep the water supply clean and safe. This same tactic was later used in the American Old West, when pioneers, traveling along the Oregon Trail, would toss silver coins into barrels to keep their water supplies fresh.



Pioneers, traveling west along such famous routes as the Oregon Trail, used silver coins to keep their water supplies fresh.

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The Romans are the first to mention the use of silver in a book known as *Pharmacoponeia*, which was written in 69 B.C. This book was a collaboration of healing materials that were found throughout the empire of Rome. A century later in his book *Natural History* (Latin. *Naturalis Historia*, 77A.D.), Pliny the Elder talks about silver as “a powerful bactericide long known for its health-giving properties. He has the use of silver mixed in plasters and then wrapped around wounds. It was considered “extremely effective” in the closing of wounds.

Roman intuition proved to be correct. Modern Western medicine recognizes silver as the

most effective anti-microbial agent, natural or otherwise. During the 19<sup>th</sup> century, silver was first applied beyond home remedies and utilized in practical medicine. Silver was used in the treatment of skin ulcers and eye treatment. In fact, the use of silver as an antimicrobial was used extensively until after World War Two when manufactured antibiotics started to become widespread.



Silver coins minted in Rome around 200 A.D. The Romans knew of the benefits of silver and used it for the wound dressings. The use of silver in medicine was standard up until after World War Two.

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## The Modern Use of Silver

Today, silver is still used for its broad-spectrum, anti-microbial properties in healthcare products ranging from bandages to burn care treatments to catheters — almost any product where infection control is critical. The majority of Americans are first exposed to silver at birth, when silver nitrate eye drops are used to prevent infection. Silver is also widely used for industrial applications, most notably in drinking water filters and swimming pool filtration systems.

One of the new uses for silver is in the footwear industry. Most notably is silver's use to destroy embarrassing foot odor.



Above are some examples of items that use silver to make life easier. The medical and sports industries are chief amongst its users. Additionally, the military and space programs also use the silver in their applications.

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## The Use of Silver in Footwear

X-Static<sup>®</sup>, the Silver Fiber is the brand name of silver used in all Acor footwear.



X-Static<sup>®</sup> has a layer of pure silver permanently bonded to the surface of the fiber. This fiber is then sewn into the lining of Acor shoes and insoles and is collectively known as Sole Defense<sup>®</sup>. Our shoes and insoles offer all of the benefits known to be inherent in pure silver. The following is brief summary of how Acor shoes and insoles can benefit you and your foot care needs.



### Antimicrobial Properties

Our feet and shoes harbor millions of organisms and bacteria which can be either harmful to us. On average, our feet sweat a cup of moisture per day, and the heat and moisture that build up in our shoes create a breeding ground for these bacteria and fungi to grow. This is why people experience such maladies as Athlete's Foot (*tinea pedis*). The antimicrobial performance of our Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> has proven to have distinct performance advantages:

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- **Speed:** Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> eliminates 99.9% of bacteria on the material in less than one hour of exposure. Most antimicrobial products test over a period of 48 hours and still do not reach this level of effectiveness.
- **Catalysts:** The hotter and more moist the environment, the more effective our X-Static<sup>®</sup> lined footwear becomes. This is perfect because bacteria and fungi are most prevalent within the confines of a shoe – causing you more trouble!
- **Safe and Natural:** X-Static<sup>®</sup> is made with pure silver, a naturally occurring element. There are no chemicals and there is no fear of toxicity to the consumer from the X-Static<sup>®</sup> material. Silver is one of the safest and most benign substances to mammals.
- **Permanent:** The use of X-Static<sup>®</sup> in Sole Defense<sup>®</sup> footwear is not a surface treatment. Silver is irreversibly bound to a polymer so it becomes a physical part of the fiber. X-Static<sup>®</sup> is permanent and performance of the product will not diminish over time.

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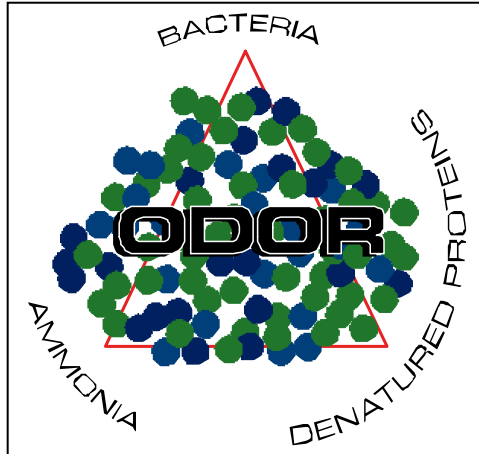
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## Anti-Odor Performance

A common misconception is that antimicrobial is synonymous with anti-odor. Sole Defense<sup>®</sup> shoes with X-Static<sup>®</sup> offer both antimicrobial and anti-odor benefits.

Bacteria are only one cause of body odor. Ammonia and denatured proteins are also significant contributors to odor in footwear. Incredibly, both ammonia and denatured proteins bind most readily with silver. Because silver is on the outside of the fiber, X-Static<sup>®</sup> allows for immediate binding with these odor causing agents – resulting in instant odor reduction!



The odor triangle shows how bacteria are only one portion of how odor is created. To be effective, a product must remove all three odor-causing agents. Silver naturally attracts ammonia and denatured proteins, then destroys them, by binding to them.

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The biophysics of footwear has become an area of significant interest in recent years. It represents the marriage of physiology, physics, textile science, podiatric, and footwear design. The specific area of thermal performance has been the primary focus of this growing area of study. Given the proper materials and constructions, it is now possible to use the existing energy of the body and the environment to actively regulate temperature through the heat transfer. Because of the inherent properties of silver, Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> is perfectly suited to this task.

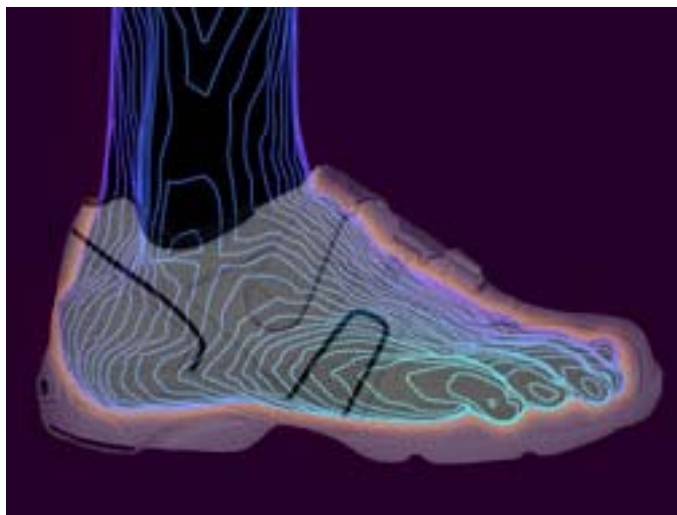
Body Heat is transferred by the feet in two basic mechanisms:

1. **Radiation:** The primary heat transfer mechanism in cold weather, contributing to approximately 90% of heat loss. During warm weather, this heat loss is negligible. The most effective way to use this energy is to reflect it back to its source and to store that energy – which is what Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> does to keep your feet warm in cold weather!

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2. **Evaporation:** The change of a liquid to a gas. When the foot can't dissipate enough heat through the conduction or convection, it will use evaporation, the result of which is perspiration. Evaporation is active in warm and cold weather, depending upon activity levels. In order to remain comfortable, the moisture generated by the feet must be transported efficiently away from the skin.



Sole Defense footwear with X-Static reflects heat back to the body in cold weather and stores it. While accelerating moisture evaporation.

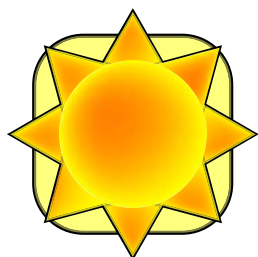
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## **Cold Weather Solution:**

Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> enhances the natural movement of moisture through hydrophobic materials the same way the body does – through evaporation. With Sole Defense<sup>®</sup> footwear, the X-Static<sup>®</sup> material accelerates the evaporation of moisture. As a result, Sole Defense<sup>®</sup> footwear transports moisture away from the body faster, allowing for a more comfortable environment and less potential for convective heat loss.



## **Warm Weather Solution:**

In warm weather, Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> addresses evaporation by dissipating the amount of moisture in contact with your feet. What's more, because heat and moisture are being dispersed over the entire surface of the shoe or orthotic, hot spots and blisters are greatly reduced!

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## **THERAPEUTIC APPLICATIONS**

The material, X-Static<sup>®</sup> is being used around the world in many therapeutic applications. These include: burn care, bandages, and now, diabetic foot care. In the foot care industry, many people claim to experience the elimination of edema (swelling). Others also claim that their feet do not feel as tired using X-Static<sup>®</sup> products. Today, X-Static<sup>®</sup> is widely touted in Asia for its therapeutic effects in numerous products.

For the diabetic, Sole Defense<sup>®</sup> footwear becomes profound. A major problem with the diabetic foot is the increased chance of amputation due to neuropathy, vascular disease and foot ulcers. According to a recent study by the Seattle Veterans Affairs Medical Center, it was found that 73% of all lower level extremity amputations occur due to the causal sequence of minor trauma, cutaneous ulceration, and wound-healing failure. This takes the form of shoe-related repetitive pressure leading to ulceration (blisters). The most common cause of these injuries is through ill-fitting shoes. [Source: WebMD.com]

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With the combined qualities of Sole Defense<sup>®</sup> footwear, a person with diabetes can have the added benefits of destroying the bacteria that can lead to an ulcerated foot.

So why is there such a profound effect?



**Electricity:** The body consists of thousands and thousands of nerves that reach the surface of the skin. In fact, the bottom of the foot alone has more than 7,000 nerve endings. The body uses these nerves to transmit electrical signals, including the feeling of pain and discomfort. Because silver is the most conductive element, Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> will pick up the electrical charges on the surface of the skin and dissipate them. The result is less discomfort.



**Magnetism:** Whenever electricity passes through a medium, a magnetic field is created. Therefore, when the electrical currents from the body are distributed throughout the lining of our Sole Defense<sup>®</sup> foot products, a magnetic field is created. Beyond the traditional belief in the benefits of magnetic therapy, many prestigious healthcare institutions have recently published studies defending the claim that magnetic products will increase blood flow and reduce swelling.

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## **EDUCATIONAL VALUE**

Despite the widespread use of silver in products for healthcare, the high-tech industry and the household, very few people are aware of its unique attributes. As a result, Acor offers the opportunity to educate you, our customer.

By the time people reach the age of understanding, at approximately three to four years of age, they have been inundated with positive messages about silver.

A few examples:

### ***Born with a silver spoon in your mouth***

This originally meant that you had a better chance of surviving childhood. We now know that silver kills E-Coli and salmonella. Both of these organisms were prevalent on non-silver eating utensils and were a common source of infant sickness and mortality.

### ***Every cloud has a silver lining***

The aristocracy in Rome and elsewhere during the Middle Ages drank from silver goblets, which were known to provide natural antibacterial protection. Because people equated silver with clean water and because rainwater was considered clean water, the two were joined: silver-like water was the advantage of poor weather.

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## *He is silver-tongued*

Today this saying refers to the wisdom or cleverness of an individual. However, the saying originally dates back to the Middle Ages, when royalty would test their wine for poison with a silver rod. If the rod turned black, it meant that there was arsenic in the wine. So, if you had a silver tongue, you possessed supernatural talents.

## *I wish I had a silver bullet...*

These are a few of the countless sayings about silver that transcend cultural differences.

Each culture has similar, if not identical, sayings. The intrinsic understanding of the value of silver is, therefore, common around the world.

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Sole Defense<sup>®</sup> footwear lined with X-Static<sup>®</sup> offers the ability to truly focus on value: Intrinsic Value, Educational Value and, ultimately the most important, Performance Value.



We offer the following as a guideline on the benefits of silver:

**Q: What was the first drug you ever received?**

A: Silver. Silver nitrate eye drops are given to babies at birth to prevent infection. In a medical sense, we are all "baptized" by silver.

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**Q: If you were to severely burn yourself anywhere in the world, what would the doctor use to treat you?**

A: Silver. Silver cream is used to prevent infection after severe burns. Because the natural protection of the skin is compromised, burn patients must have the best bacteria protection available.

**Q: What is the most electrically conductive element?**

A: Silver.

**Q: What is the most thermally conductive element?**

A: Silver.

**Q: What has the highest thermal infrared (IR) rating?**

A: Silver.

**Q: What is the most effective electromagnetic interference (EMI) shielding element?**

A: Silver.

The point of this exercise is simple: Most are probably not aware of the miraculous spectrum of qualities inherent to silver.

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## Some Frequently Asked Questions

### **Is Silver Safe? Is Sole Defense Safe?**

Silver is widely used today in medical products and in consumer products. In fact, the very first drug most people are given at birth is *silver nitrate*, in the form of eye drops. Today, silver is used in everything from burn care for infection control to eating utensils. The best colloquial example is the abundance of silver fillings for dental repair.

Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> products are extremely safe because the lining is made with a pure silver adhered right to the fiber. Prestigious institutions throughout the world have validated the antimicrobial performance and safety of X-Static<sup>®</sup> silver fibers in many published medical journals.

### **Are Some People Allergic to Silver?**

Some people are allergic to silver jewelry and make the assumption that they are allergic to silver. On the contrary, silver jewelry is made from an alloy called “sterling silver” and the people are allergic to the various other metals in its makeup. Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> products are made with a pure silver – there has been no documented cases of allergies to pure silver.

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## Some Frequently Asked Questions

### **What Kind of Testing Has Been Performed on the silver in your footwear?**

X-Static<sup>®</sup> is registered with the Environmental Protection Agency (EPA) and has more than 12 years of published clinical research supporting its safety and claims. X-Static<sup>®</sup> is also used in many Class 1 and Class 2 FDA-approved medical devices. The top institutions in the world, including Johns Hopkins and the National Institute of Health, have tested, approved of, and currently use X-Static<sup>®</sup> – the same fiber in Sole Defense<sup>®</sup> footwear.

### **Should I Be Nervous About Using An Anti-Odor or Antimicrobial In My Footwear?**

Yes, if it is not lined with X-Static<sup>®</sup>. Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> is not like other antimicrobial products. First, Sole Defense<sup>®</sup> footwear with X-Static<sup>®</sup> is all natural and there is no fear of toxicity as found in other anti-odor or antimicrobial products. Second, X-Static<sup>®</sup> has all the requisite regulatory approvals. Third, X-Static<sup>®</sup> is not *just* an antimicrobial. It happens to be the best antimicrobial product, but it also has many other valuable attributes.

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Footdefense.com invites you to share this e-Book with your family, your friends and your loved ones. We are certain that knowing the value of silver will enrich both your life and theirs. Thank you for your interest in Sole Defense products and please stop back to learn more about this truly "precious metal".

For more details on silver, or a list of clinical research, please email us at: [footdefense@acor.com](mailto:footdefense@acor.com)



**For your lifestyle.  
For your health.  
For your Foot Defense.**

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