



Silver Nitrate Applicator Disposal

FACT SHEET 37-066-0514

Background: Silver nitrate applicators (also referred to as STYPT-STIX, caustic pencils, or “sticks”) cauterize skin, remove warts, and suppress excessive granulation and sloughs around wounds. Silver nitrate sticks are also used to cauterize superficial blood vessels in the nose to help stop nose bleeds. Dentists use them to heal oral ulcers. Veterinarians use silver nitrate sticks to stop bleeding of minor cuts, particularly those encountered when clipping the nails of dogs or cats. The sticks are generally stocked in packages of 10 sticks or tubes of 100 sticks. Silver nitrate sticks are a pharmaceutical product with an expiration date. Once the expiration date elapses, all remaining sticks in the package require disposal.

Composition: A rigid wooden applicator stick is tipped with 75% Silver Nitrate and 25% Potassium Nitrate in solid form that resembles a match tip. Silver nitrate is commonly employed as a caustic antiseptic and an astringent. Potassium nitrate is used as a topical antiseptic on mucous membranes. The applicators are activated by contact with body fluids or distilled water when applied to a dry area. One applicator with an estimated contact time of 10 to 30 seconds is sufficient for each application. The degree of cauterization depends upon the number of applicators employed and how long the compound is allowed to act. The longer the silver nitrate is in contact with a wound, the more caustic the concentration in solution becomes.

U.S. Environmental Protection Agency (EPA) Classification: The silver nitrate solid is a strong irritant to skin and tissue and is an oxidizer. The EPA classifies silver concentrations greater than five milligrams per liter, determined using the toxicity characteristic leaching procedure (TCLP), as hazardous waste (HW). The EPA HW number for silver is D011. The EPA classifies oxidizers, defined by 49 Code of Federal Register (CFR) Part 173, as ignitable HW. The EPA HW number for ignitability is D001. Product material safety data sheets instruct users to perform proper waste characterizations prior to disposal in accordance with all federal, state, and local regulations. They also list the product as a DOT classified oxidizer.

Characterizing Unused Sticks: The US Army Public Health Command (USAPHC) Army Institute of Public Health (AIPH) conducted a waste characterization sampling study of unused silver nitrate sticks to determine the silver concentrations in unused, expired sticks. Five representative samples (approximately 115 sticks per sample) were submitted for TCLP silver analyses. All sample results exceeded the EPA HW limit of 5 mg/l by an average of 50 times the limit, indicating the sticks are HW for silver content. Additionally, the sticks meet the HW criteria as an oxidizer and are also ignitable HW.

If you have questions regarding this document please contact:

U.S. Army Public Health Command, Waste Management Program,
DSN 584-3651; COMM 410-436-3651; or email usarmy.apg.medcom-phc.mbx.hmwp@mail.mil
5158 Blackhawk Road, Aberdeen Proving Ground, Maryland 21010-5403

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Disposal of Unused Silver Nitrate Sticks: Unused silver nitrate sticks are considered pharmaceutical products and may be eligible for inclusion in the pharmaceutical return to vendor program at your medical treatment facility (MTF). This program is subject to state specific pharmaceutical regulations. For more information on this program, reference the USAPHC Expired Pharmaceutical Classification fact sheet. Recycling the silver content with a qualified recycling company that can address the oxidizer characteristic may also be an option. However, if the unused sticks are not eligible for these options, manage them as ignitable and toxic HW with EPA HW numbers D001 and D011.

Characterizing Used Sticks: After treatment, visible amounts of silver nitrate remain on the tip of each stick because the average treatment time does not deplete all of the solid content on the tip of the stick. The treatment is caustic in nature and it would be impractical and inhumane to leave the stick in the wound until depletion of all material. The solid silver nitrate remaining on each stick tip is an oxidizer since it has not been completely consumed in the treatment process. The AIPH conducted a waste characterization sampling study of used silver nitrate sticks to determine the silver concentrations remaining on the sticks after treatment. A sampling plan and procedures were devised to collect representative samples based on clinical treatment practices of approximately 10-30 seconds of application time. Seven representative samples (approximately 115 sticks per sample) were submitted for TCLP silver analyses. All sample results exceeded the EPA HW limit of 5 mg/l by an average of 40 times the limit, indicating the sticks are HW for silver content.

Addressing the Biohazard: Silver nitrate sticks are used in wound treatment and do contact human and/or animal body fluids. During typical treatment, the used sticks will not be covered in free flowing blood or body fluids and will not meet the regulated medical waste definition in the U.S. Army Medical Command Regulation 40-35, Management of Regulated Medical Waste (RMW). The chemical composition of the product is expected to effectively inactivate infectious organisms during the treatment process because both the silver nitrate and potassium nitrate possess antiseptic properties.

Disposal of Used Silver Nitrate Sticks: Recycling the silver content with a qualified recycling company that can address the oxidizer characteristic may be an option. However, if the used sticks are not eligible for recycling, manage them as ignitable and toxic HW (for silver content and oxidizer) with EPA HW numbers D001 and D011. Contact the installation environmental office to explore available recycling options and develop a waste profile for silver nitrate sticks. Collect in HW accumulation areas according to your facilities' established HW management procedures.