MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**SILVER NITRATE, SOLUTION, 0.153 N**
Catalog #	1228
Version #	02
Revision date	23-Jul-2009
CAS #	Mixture
Manufacturer information	GFS Chemicals, Inc. P.O. Box 245 Powell, OH 43065 US www.gfschemicals.com Fax 740-881-5989 Phone 740-881-5501 Toll Free 800-858-9682 Emergency Assistance Chemtrec 800-424-8300

2. Hazards Identification

Emergency overview	DANGER May be harmful if swallowed.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Ingestion.
Eyes	Do not get this material in contact with eyes.
Skin	Do not get this material in contact with skin.
Inhalation	Do not breathe dust/fume/gas/mist/vapors/spray.
Ingestion	Harmful if swallowed. Do not ingest.
Signs and symptoms	Exposure results in temporary blackening area on skin.
Potential environmental effects	Components of this product are hazardous to aquatic life. May cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

Hazardous components	**CAS #**	**Percent**
SILVER NITRATE	7761-88-8	2.5 - 10
Non-hazardous components	**CAS #**	**Percent**
WATER	7732-18-5	90 - 100

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
Skin contact	Remove and isolate contaminated clothing and shoes. Immediately flush skin with plenty of water. Get medical attention immediately. For minor skin contact, avoid spreading material on unaffected skin. Wash clothing separately before reuse.
Inhalation	Move to fresh air. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or poison control center immediately.

Ingestion Have victim rinse mouth thoroughly with water. Never give anything by mouth to a victim who is unconscious or is having convulsions. Give salt water. Get medical attention immediately. Do not induce vomiting without advice from poison control center. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If material is ingested, immediately contact a poison control center.

Notes to physician In case of shortness of breath, give oxygen. Keep victim warm. Symptoms may be delayed.

General advice In case of shortness of breath, give oxygen. Keep victim warm. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties Paper or cloth which has contacted this product may ignite after drying out. Not a fire hazard. The product is not flammable.

Extinguishing media

Suitable extinguishing media Water. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO_2).

Protection of firefighters

Protective equipment and precautions for firefighters In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers. Cool containers exposed to flames with water until well after the fire is out.

Specific methods In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers.

6. Accidental Release Measures

Personal precautions Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Keep upwind. Keep out of low areas. Keep people away from and upwind of spill/leak. Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire. Ventilate closed spaces before entering them. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not contaminate water.

Methods for containment Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewers, basements or confined areas.

Methods for cleaning up Should not be released into the environment.

Large Spills: Dike far ahead of spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Following product recovery, flush area with water.

Never return spills in original containers for re-use.

7. Handling and Storage

Handling Use only with adequate ventilation. Wear personal protective equipment. Wash thoroughly after handling. Avoid release to the environment. Handle and open container with care.

Storage Keep locked-up. Store in a well-ventilated place. Keep container tightly closed. Keep out of the reach of children.

8. Exposure Controls / Personal Protection

Occupational exposure limits

ACGIH

Components	CAS #	Type	Value	Form
SILVER NITRATE	7761-88-8	TWA	0.01 mg/m3	

U.S. - OSHA

Components	CAS #	Type	Value	Form
SILVER NITRATE	7761-88-8	PEL	0.01 mg/m3	
		TWA	0.01 mg/m3	

Engineering controls Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Respiratory protection In case of insufficient ventilation wear suitable respiratory equipment.

Hand protection Wear protective gloves.

Eye / face protection Wear chemical goggles. Do not get this material in contact with eyes.

Skin protection Wear chemical protective equipment that is specifically recommended by the manufacturer. It may provide little or no thermal protection. Wear protective gloves.

General hygeine considerations Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice.

9. Physical & Chemical Properties

Appearance Clear.

Color Colorless.

Odor Odorless.

Odor threshold Not available.

Physical state Liquid.

Form Liquid.

pH Not available.

Melting point < 32 °F (< 0 °C)

Freezing point Not available.

Boiling point > 212 °F (> 100 °C)

Flash point Not available.

Evaporation rate Not available.

Flammability Not available.

Flammability limits in air, upper, % by volume Not available.

Flammability limits in air, lower, % by volume Not available.

Vapor pressure Not available.

Vapor density Not available.

Specific gravity 1.02

Relative density 1.02 g/cm3

Solubility (water) Miscible.

Partition coefficient (n-octanol/water) Not available.

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Molecular weight 169.8900

Molecular formula AgNO3

10. Chemical Stability & Reactivity Information

Chemical stability Stable at normal conditions. No hazards to be especially mentioned.

Conditions to avoid May darken on exposure to light.

Incompatible materials Halides. Many salts including amine salts.

Hazardous decomposition products No hazardous decomposition products are known.

Possibility of hazardous reactions Hazardous polymerization does not occur.

11. Toxicological Information

Acute effects

Acute Oral: LD 50

SILVER NITRATE	7761-88-8	Mouse 50 mg/kg

Acute Toxicity other routes: LD 50

SILVER NITRATE	7761-88-8	Mouse 23.783 mg/kg Intraperitoneal
SILVER NITRATE	7761-88-8	Mouse 13.9 mg/kg Intraperitoneal Male

Toxicology data for the preparation

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

12. Ecological Information

Ecotoxicity Components of this product are hazardous to aquatic life.

Aquatic plant toxicity: EC 50

SILVER NITRATE	7761-88-8	Green algae (Scenedesmus dimorphus) 0.003 - 0.015 mg/l 48 h Static Intoxication

Invertebrate Toxicity: EC 50

SILVER NITRATE	7761-88-8	Scud (Gammarus pseudolimnaeus) 0.0037 - 0.0055 mg/l 72 h Flow through Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0039 mg/l 64 h Static Intoxication
SILVER NITRATE	7761-88-8	Leech (Nephelopsis obscura) 0.095 mg/l 96 h Static Intoxication
SILVER NITRATE	7761-88-8	Scud (Gammarus pseudolimnaeus) 0.0037 - 0.0055 mg/l 96 h Flow through Intoxication
SILVER NITRATE	7761-88-8	Rotifer (Philodina acuticornis) 1.4 mg/l 96 h Static Intoxication
SILVER NITRATE	7761-88-8	Tubificid worm (Tubifex tubifex) 0.021 - 0.055 mg/l 96 h Renewal Intoxication
SILVER NITRATE	7761-88-8	Rotifer (Philodina acuticornis) 15.7 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Rotifer (Philodina acuticornis) 3.8 mg/l 24 h Static Intoxication
SILVER NITRATE	7761-88-8	Rotifer (Philodina acuticornis) 5.3 mg/l 24 h Static Intoxication
SILVER NITRATE	7761-88-8	Ostracod (Cypris subglobosa) 0.0035 - 0.0042 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Amphipod (Crangonyx pseudogracilis) 0.005 - 0.006 mg/l 48 h Renewal Intoxication
SILVER NITRATE	7761-88-8	Scud (Gammarus pseudolimnaeus) 0.0038 - 0.0058 mg/l 24 h Flow through Intoxication
SILVER NITRATE	7761-88-8	Scud (Gammarus pseudolimnaeus) 0.0038 - 0.0058 mg/l 48 h Flow through Intoxication
SILVER NITRATE	7761-88-8	Rotifer (Philodina acuticornis) 1.7 mg/l 96 h Static Intoxication
SILVER NITRATE	7761-88-8	Tubificid worm (Tubifex tubifex) 0.033 - 0.046 mg/l 48 h Renewal Intoxication
SILVER NITRATE	7761-88-8	Tubificid worm (Tubifex tubifex) 0.035 - 0.048 mg/l 24 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Alona affinis) 0.025 - 0.056 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Ceriodaphnia reticulata) 0.0011 - 0.0017 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Ceriodaphnia reticulata) 0.0064 mg/l 7 d Renewal Mortality
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0008 - 0.001 mg/l 48 h Flow through Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0008 - 0.0011 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0009 - 0.0012 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.001 - 0.0011 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0013 - 0.0018 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0023 - 0.0036 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0029 mg/l 21 d Renewal Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0036 mg/l 21 d Renewal Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0036 mg/l 7 d Renewal Mortality
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0039 mg/l 21 d Renewal Intoxication
SILVER NITRATE	7761-88-8	Dungeness or edible crab (Cancer magister) 0.016 - 0.087 mg/l 96 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0054 - 0.0156 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.006 - 0.008 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0075 - 0.0092 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0109 - 0.0143 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.0143 - 0.0155 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.015 - 0.02 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.016 - 0.024 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.017 - 0.023 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.017 - 0.034 mg/l 24 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.02 - 0.04 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.042 - 0.054 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia magna) 0.052 - 0.059 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia pulex) 0.0017 - 0.0023 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Water flea (Daphnia pulex) 0.0027 mg/l 7 d Renewal Mortality
SILVER NITRATE	7761-88-8	Water flea (Moina dubia) 0.0025 - 0.0082 mg/l 48 h Static Intoxication
SILVER NITRATE	7761-88-8	Amphipod (Crangonyx pseudogracilis) 0.004 - 0.005 mg/l 96 h Renewal Intoxication

Micro-organisms Toxicity: LC 50

SILVER NITRATE	7761-88-8	Protozoa (Spirostomum ambiguum) 0.009 mg/l 24 h Static Mortality
SILVER NITRATE	7761-88-8	Protozoa (Spirostomum ambiguum) 0.0088 mg/l 48 h Static Mortality
SILVER NITRATE	7761-88-8	Nematode (Caenorhabditis elegans) 3 - 10 mg/l 24 h Static Mortality
SILVER NITRATE	7761-88-8	Nematode (Caenorhabditis elegans) 1 - 7 mg/l 72 h Static Mortality
SILVER NITRATE	7761-88-8	Nematode (Caenorhabditis elegans) 1 - 10 mg/l 48 h Static Mortality
SILVER NITRATE	7761-88-8	Nematode (Caenorhabditis elegans) 0.1 - 4.98 mg/l 96 h Static Mortality

Environmental effects Harmful to aquatic life.

Persistence and degradability Not available.

13. Disposal Considerations

Waste codes	D011: Waste Silver
Disposal instructions	Dispose of this material and its container at hazardous or special waste collection point. Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.
Waste from residues / unused products	Not applicable.

14. Transport Information

DOT

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

SILVER NITRATE	7761-88-8	1.0 % N740

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

SILVER NITRATE	7761-88-8	N740 Listed.

CERCLA (Superfund) reportable quantity

SILVER NITRATE, REAGENT (ACS): 1.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance	No
Section 311 hazardous chemical	Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

SILVER NITRATE	7761-88-8	500 LBS

US - Pennsylvania RTK - Hazardous Substances: Listed substance

SILVER NITRATE	7761-88-8	Listed.

16. Other Information

Further information HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings	Health: 3 Flammability: 0 Physical hazard: 1
NFPA ratings	Health: 3 Flammability: 0 Instability: 2
Disclaimer	The information in the sheet was written based on the best knowledge and experience currently available. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
Issue date	23-Jul-2009
This data sheet contains changes from the previous version in section(s):	This document has undergone significant changes and should be reviewed in its entirety.