

Safety data sheet
According to Regulation n. 1907/2006 and Regulation 878/2020
SILVER NITRATE 63,5%



Revision n. XII – 25.06.2024
 Replaces revision XI – 12.05.2023

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Chemical name SILVER NITRATE (AgNO₃)
 Product code 05
 08
 CAS 7761-88-8
 EC number 231-853-9
 INDEX number 047-001-00-2
 Molecular weight 169,87
 Raw formula AgNO₃

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended uses Industrial use. Additive for electroplating
 Uses advised against None in particular

1.3 Details of the supplier of the safety data sheet

Name FAGGI ENRICO S.P.A.
 Address Via Majorana, 101/103 50019 Sesto Fiorentino FI
 Telephone number 055311861
 Fax number 055311791
 Competent person responsible for the safety data sheet lorenzo.magaldi@faggi.it

1.4 Emergency telephone number 111 - Medical helpline operating in England, in Scotland (NHS 24) and in Wales (NHS Direct Wales)

1.5 Registration number 01-2119513705-43—XXXX

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance according to Regulation (EC) n. 1272/2008

Hazard classes	Category codes	Hazards indications
Ox. Sol.	1	H271
Met. Corr.	1	H290
Skin corr.	1A	H314
Eye Dam.	1	H318
Reproductive tox. (oral route)	1B	H360D
Aquatic acute	1	H400
Aquatic chronic	1	H410

2.2 Label elements

Pictograms



Signal word

DANGER

Hazard statements

H271	May cause fire or explosion; strong oxidizer
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H360D	May damage the unborn child

Safety data sheet
According to Regulation n. 1907/2006 and Regulation 878/2020
SILVER NITRATE 63,5%



Revision n. XII – 25.06.2024
 Replaces revision XI – 12.05.2023

Precautionary advice	H400 H410	Very toxic to aquatic life Very toxic to aquatic life with long lasting effects
	P234	Keep only in original container/packaging
	P260	Do not breathe dust/fume/gas/mist/vapours/spray.
	P303+P361+P353	IF ON SKIN: Take off immediately all contaminated clothing, rinse skin /take a shower
	P305+P351+P338	IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
	P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

2.3 Other hazards
 In combination with ammonia, silver nitrate can form unstable compounds such as silver fulminate.
 It does NOT contain PBT / vPvB substances according to Regulation (EC) 1907/2006, annex XIII
 It does NOT contain substances that interfere with the endocrine system in accordance with Regulation (EC) 1907/2006 art.59 paragraph 1 and in accordance with the criteria established in Regulation (EU) 2017/2100 and Regulation (EU) 2018/605.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance: SILVER NITRATE

CAS: 7761-88-8
 CE: 231-853-9
 INDEX: 047-001-00-2
 ATE: Not applicable
 M factor (acute): 1000
 M factor (chronic): 100

4. FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation	Immediately move the injured person to fresh air. Artificial respiration may be required. Refer to medical attention.
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Safety data sheet
According to Regulation n. 1907/2006 and Regulation 878/2020
SILVER NITRATE 63,5%



Revision n. XII – 25.06.2024
Replaces revision XI – 12.05.2023

Ingestion	Do not induce vomiting. Have a glass of water drink. Contact a doctor immediately. Do not give anything if the person is not conscious.
Contact with skin	Immediately rinse with water for at least 15 minutes and wash with soap. Remove contaminated clothing.
Contact with eyes	In case of contact with eyes, wash them immediately with water for at least 15 minutes and contact a doctor

Recommendations:

- Need to see a doctor immediately YES
- Possibility of delayed effects following exposure YES
- Move the exposed individual from the place of exposure to the open air YES
- Remove the clothing and shoes of the exposed individual YES
- How to handle contaminated clothing With gloves
- For first aiders, wear PPE YES

4.2 Most important symptoms and effects, both acute and delayed

In case of inhalation or ingestion: sore throat, cough, burning sensation. Shortness of breath, difficulty breathing. Blue lips and nails and skin. Dizziness, headache, nausea. Confusional state, convulsions, unconsciousness. Symptoms may be delayed. Abdominal pain, burning sensation. Shock or collapse.

In case of skin contact: pain, redness, burns, blisters.

In case of eye contact: redness, pain. Severe deep burns. Vision loss

4.3 Indication of any immediate medical attention and special treatment needed

Contact a doctor immediately. It is of the utmost importance to clean all contaminated areas of the body, including the scalp and nails.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media CO2 or powder or nebulised water extinguishers.

Unsuitable extinguishing media None

5.2 Special hazards arising from the substance or mixture

The substance decomposes on heating producing toxic fumes including nitrogen oxides. It is a strong oxidant and reacts violently with ammonia, combustible materials and reducing agents. Although the substance is not combustible, it can cause or favor the combustion of other materials.

5.3 Advice for firefighters

Normal fire fighting clothing, such as an open circuit compressed air breathing apparatus (EN137), flame retardant suit (EN469), flame retardant gloves (EN659) and firefighter boots (HOA29 or A30)

Protective measures to be taken:

- Remove the containers from the fire area, if this is possible without risk, or cool them, because if the substance is exposed to thermal radiation or if it is directly involved it can give rise to toxic fumes and an explosion.
- Damaged containers must only be handled by authorized expert personnel.
- Proceed to extinguish the fire at a safe distance from the containers using hoses or automatic fire extinguishing systems with nozzles positioned above the containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Safety data sheet
According to Regulation n. 1907/2006 and Regulation 878/2020
SILVER NITRATE 63,5%



Revision n. XII – 25.06.2024

Replaces revision XI – 12.05.2023

6.1.1. For non-emergency personnel

Warn all persons: danger of intoxication - Evacuate the contaminated area - Alert internal emergency workers or the fire brigade

6.1.2. For emergency responders

Wear protective equipment:

- mask with ABEK P2 filters or breathing apparatus,
- gloves compliant with EN420 E374 standards
- flame retardant and acid resistant protective clothing compliant with UNI EN 13034:2006 type 6 UNI EN ISO 11612:2009 A1-B1-C1-E1
- eye protection devices compliant with Directive 89/686/EEC and standard EN166:2001.

Remove all sources of ignition if the operation is without risk.

Provide adequate ventilation of the premises.

If possible, operate upwind

Avoid coming into contact with the substance or handling the containers without adequate protection.

Isolate the area until the substance is completely dispersed.

6.2 Environmental precautions

Evacuate the dangerous area. Limit evaporation and reduce the affected area to a minimum by containing the leak. Do not allow the spill to reach sewers or natural watercourses and, if it has not been possible, notify the competent authorities immediately.

6.3 Methods and material for containment and cleaning up

6.3.1. Advice in order to contain a spill

Close the manholes. Do not absorb with sawdust or other flammable materials. Collect spilled substance in sealable containers; if appropriate, pre-humidify them to avoid dust dispersion

6.3.2. Advice in order to clean-up a spill

Wash the contaminated area with water.

6.3.3 Other information

None

6.4 Reference to other sections

None

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

7.1.1. Recommendations in order to manipulate the substance or the mixture in a safe manner, such as containment measures and prevention of fire and aerosol and powders formation

Use the product only under forced suction, keep separate from incompatible materials (ammonia, flammable and reducing agents). Keep separate from combustible material.

7.1.2. General recommendation on work hygiene

Do not eat, drink and smoke in work areas. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas

7.2. Conditions Safe storage, including any incompatibilities

7.2.1. Risk management associated with explosive atmospheres, corrosive conditions, flammability hazards, incompatible substances or mixtures, evaporative conditions, potential ignition sources

Keep separate from acetylene, ammonia, antimony, halides and alkalis.

Safety data sheet
According to Regulation n. 1907/2006 and Regulation 878/2020
SILVER NITRATE 63,5%



Revision n. XII – 25.06.2024

Replaces revision XI – 12.05.2023

7.2.2 Containment of the effects of weather conditions, pressure, temperature, sunlight, humidity and vibrations

Store in closed and labeled containers away from sunlight.

7.2.3. Conditions for keeping substances / mixtures intact

Close the containers immediately after use.

7.2.4 Provisions relating to ventilation, specific design of storage rooms or containers, quantitative limits in storage conditions, compatibility of packaging

Storage rooms must be ventilated and closed.

7.3. Specific end use(s)

Industrial use. Additive for electroplating. Pharmaceutical industry

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters (related to metallic Silver species)

EU ELV TWA 0,01 mg/m³ (expressed as Ag)

OEL (IT) TWA 0,01 mg/m³ (expressed as Ag)

DNEL

Workers

Systemic effects for long-term exposure – inhalation: 0.96 mg/m³

Systemic effects for short-term exposure – inhalation: no hazard identified

Local effects for long-term exposure – inhalation: high hazard (no threshold derived)

Local effects for short-term exposure – inhalation: high hazard (no threshold derived)

Systemic effects for long-term exposure – dermal: 0.34 mg/kg body weight per day

Systemic effects for short-term exposure – dermal: no hazard identified

Local effects for long-term exposure – dermal: high hazard (no threshold derived)

Local effects for short-term exposure – dermal: high hazard (no threshold derived)

Eye hazards: medium hazard (no threshold derived)

General population.

Systemic effects for long-term exposure – inhalation: 0.24 mg/m³

Systemic effects for short-term exposure – inhalation: no hazard identified

Local effects for long-term exposure – inhalation: high hazard (no threshold derived)

Local effects for short-term exposure – inhalation: high hazard (no threshold derived)

Systemic effects for long-term exposure – dermal: 0.17 mg/kg body weight per day

Systemic effects for short-term exposure – dermal: no hazard identified

Local effects for long-term exposure – dermal: high hazard (no threshold derived)

Local effects for short-term exposure – dermal: high hazard (no threshold derived)

Systemic effects for long-term exposure – oral: 0.17 mg/kg body weight per day

Systemic effects for short-term exposure – oral: no hazard identified

Eye hazards: medium hazard (no threshold derived)

PNEC

Freshwater: 0.046 µg/L

Marine water: 0.86 µg/L

Sewer treatment plant: 0.025 µg/L

Sediment (freshwater): 438.13 mg/kg sediment dry weight

Sediment (marine water): 438.13 mg/kg sediment dry weight

Soil: 1.05 mg/kg soil dry weight

8.2. Exposure controls

Provide for appropriate air extraction / evacuation in the workplace and on the operating machine.

Provide for the installation of an emergency shower and an eye shower.

8.2.1. Appropriate engineering controls

Safety data sheet
According to Regulation n. 1907/2006 and Regulation 878/2020
SILVER NITRATE 63,5%



Revision n. XII – 25.06.2024
 Replaces revision XI – 12.05.2023

Periodically carry out personal environmental sampling and clinical examinations.

8.2.2. Individual protection measures, such as personal protective equipment

Eye/face protection	Eye protective equipment compliant with Directive 89/686/EEC and standard EN166:2001
Skin protection (hands)	Chemical gloves according to EN 420 EN 374 Glove material: Natural latex Material thickness: 0.5 mm Penetration time: ≥ 60 min DIN EN374 method
Skin protection (body)	Protective and anti-acid clothing compliant with UNI EN 13034:2006 type 6 standards
Respiratory protection	Mask with B,P2 or ABEK P3 filters or self-contained breathing apparatus
Thermal hazards	Protective clothing compliant with the UNI EN ISO 11612:2009 A1-B1-C1-E1 standard

8.2.3. Environmental exposure controls

Maintain suction in all environments using localized collection systems and ambient air exchange. Convey the aspirated volumes to an abatement system and then into the atmosphere. Do not use recirculating air suction systems. Avoid any spillage into the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	Solid		
Color	White		
Odor	Odorless		
Melting point / freezing point	212° C (101,325 Pa)		
Boiling point or initial boiling point and boiling range	Not applicable		
Flammability	Not inflammable		
Lower and upper explosive limits	Not explosive		
Flash point	Not inflammable		
Self-ignition temperature	Not inflammable		
Decomposition temperature	250 - 440 °C (101,325 Pa)		
pH	Data not available		
Cinematic viscosity	Not applicable		
Solubility	2150 g/l in water at 20°		
Production coefficient n-octanol / water (logarithmic value)	Not applicable		
Vapor pressure	Not applicable		
Density and / or relative density	4.35 g/cm ³		
Relative vapor density	Not applicable		
Characteristics of the particles	Silver nitrate is marketed in solid crystalline form and in the form of solutions. Typical particle size specifications have been provided by six major European producers/importers.		
	Producer	D10 (µm)	D50 (µm)
			D90 (µm)

Safety data sheet
According to Regulation n. 1907/2006 and Regulation 878/2020
SILVER NITRATE 63,5%



Revision n. XII – 25.06.2024
 Replaces revision XI – 12.05.2023

1	289-329	459-492	721-727
2	221	520	816
3	174	329	571
4	75 - 92	289 - 302	534 - 568
5	231	367	468
6	145	266	459

9.2. Other information

None

10. STABILITY AND REACTIVITY

10.1 Reactivity

The product has strongly oxidizing properties.

10.2 Chemical stability

The product is delivered in stable condition.

10.3 Possibility of hazardous reactions

Wood and other organic materials impregnated with silver nitrate can spontaneously ignite when dry. Contact with ammonia can produce explosive compounds.

10.4 Conditions to avoid

Keep away from sunlight.

10.5 Incompatible materials

Violent reactions have been noted between silver nitrate and the following substances: acetic aldehyde, phosphorus, ammonia and ethanol, acetylene and derivatives, acrylonitrile, ammonia and sodium carbonate, ammonia and sodium hydroxide, arsenic, 1,3-butadiene, butene -3ino, chlorosulfonic acid, ethanol, phosphine.

10.6 Hazardous decomposition products

The substance decomposes producing toxic fumes including nitrogen oxides (NOx). The substance is a strong oxidant and reacts violently with combustible and reducing materials causing fire and explosion.

11. TOXICOLOGICAL INFORMATION

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

The acute oral, dermal and inhalation toxicity studies have been waived in accordance with the column 2 of the Annex VII of REACH Regulation: the study does not need to be conducted as the substance is classified as corrosive to the skin (Category 1A).

Skin corrosion / irritation

Corrosive on the skin according to the criteria of Reg, (EC) 1272/08

Serious eye damage/irritation

Causes serious eye damage according to the criteria of Reg, (EC) 1272/08

Respiratory or skin sensitization

Skin sensitization study has been waived in accordance with the column 2 of Annex VII of REACH Regulation. The studies (*in-vivo* and *in-vitro*) do not need

Safety data sheet
According to Regulation n. 1907/2006 and Regulation 878/2020
SILVER NITRATE 63,5%



Revision n. XII – 25.06.2024
 Replaces revision XI – 12.05.2023

		to be conducted if the substance is classified as skin corrosive (Cat. 1A)
	Germ cell mutagenicity	Data not available
	Carcinogenicity	Data not available.
	Reproductive toxicity	May affect fertility.
		NOAEL (fertility): 120 mg/kg bw/day (rat, oral)
		NOAEL (developmental toxicity) : 40 mg/kg bw/day (rat, oral)
	STOT – single exposure	No known effects
	STOT – repeated exposure	NOAEL oral rat: 120 mg/kg bw/day
		Effects: argyria
11.2	Information on other hazards	
	None	
12.	ECOLOGICAL INFORMATION	
12.1	Toxicity	PNEC: check section 8.1 The most sensitive data reported is a 96 hour LC50 of 1.2 µg Ag/L for Pimephales promelas (Bielmeyer et al. 2007). The lowest reported 48 hour EC50 is 0.22 µg Ag/L for Daphnia magna based on measured dissolved silver (Bianchini et al. 2002). This value is also selected as the acute ERV for classification purposes.
12.2	Persistence and degradability	Not degradable
12.3	Bioaccumulative potential	Not bioaccumulative
12.4	Mobility in soil	Log Kd 3.60 soil Log Kd 5.28 suspended matter Log Kd 4.05 sediment
12.5	Results of PBT and vPvB assessment	Not applicable
12.6	Endocrine disrupting properties	No known effects
12.7	Other adverse effects	No known effects
13.	DISPOSAL CONSIDERATIONS	
13.1.	Waste treatment methods	The solutions intended for disposal can be neutralized with lime or sodium carbonate. Do not discharge into sewers or into the environment and dispose of at authorized facilities. Packaging must not be reused and must be disposed of at authorized facilities.
14.	TRANSPORT INFORMATION	
14.1	UN number or ID number	1493
14.2	Official UN shipping name	Silver nitrate
14.3	Transport hazard class(es)	5.1
	ADR/RID/IMDG/ICAO-IATA	5.1 + dangerous for the environment
	ADR/RID/IMDG/ICAO-IATA	E
	ADR Tunnel restriction code	

Safety data sheet
According to Regulation n. 1907/2006 and Regulation 878/2020
SILVER NITRATE 63,5%



Revision n. XII – 25.06.2024
 Replaces revision XI – 12.05.2023

14.4	IMDG – EmS	F-A S-Q	
14.4	Packing group	II	
14.5	Dangers for the environment		
	ADR/RID/ICAO-IATA:	YES	
	IMDG: Marine Contaminant:	YES	
14.6	Special precautions for user		
	Transport must be carried out by vehicles authorized for the transport of dangerous goods according to the provisions of the current edition of the A.D.R. Agreement. and the applicable national provisions. Transport must be carried out in the original packaging and, in any case, in packaging which is made of materials which cannot be attacked by the contents, and which are not likely to generate dangerous reactions. Those responsible for loading and unloading dangerous goods must have received appropriate training on the risks presented by the preparation and on any procedures to be adopted in the event of emergency situations.		
14.7	Maritime transport in bulk in accordance with the IMO Acts		
	Bulk transport is not foreseen		
15.	REGULATORY INFORMATION		
15.1	Safety, health and environmental regulations/legislation specific for the substance or mixture		Applicability
	Reg. (EC) 1907/2006 / EC Reach		YES
	Reg. (EC) 1272/2008 CLP and subsequent changes and additions		YES
	Reg. (CE) 2037/2000 "Substances that deplete the ozone layer"		NO
	Reg. (EC) 850/2004 "Persistent organic pollutants"		NO
	Reg. (EC) 689/2008 "export and import of dangerous chemicals"		NO
	Substance listed in Annex I of Dir. 2012/18 / EU so-called Seveso		YES
	Legislative Decree 81/2008 Consolidated Law on health and safety at work		YES
	Directive 2014/103 / EU "Adr"		YES
	Reg. (CE) 1907/2006/CE Reach art. 59 – Candidate List of Substances of Very High Concern (SVHC)		NO
	Reg. (CE) 1907/2006/CE Reach - Annex XIV – Authorisation List		NO
	Reg. (CE) 1907/2006/CE Reach - Annex XVII – Restriction List		Limited use
	https://echa.europa.eu/it/substances-restricted-under-reach		Item 30 - 75 (check link)
15.2	Chemical safety assessment		
	A chemical safety assessment was not carried out		
16.	OTHER INFORMATION		
	Changes compared to the previous edition		
	Changes to sections 1-8-9-11-12-14-16		
	Acronym and abbreviation legend		
	ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road		
	GHS: Globally Harmonized System of Classification and Labeling of Substances		
	EINECS: European Inventory of Chemical Substances		
	CAS: Chemical Abstract Service		
	STA: Acute Toxicity Estimate		
	PBT: Persistent, Bioaccumulative and Toxic.		
	vPvB: (very persistent and very bioaccumulative). Very persistent and very		

Safety data sheet
According to Regulation n. 1907/2006 and Regulation 878/2020
SILVER NITRATE 63,5%



Revision n. XII – 25.06.2024

Replaces revision XI – 12.05.2023

bioaccumulative
LD: lethal dose
PNEC: predicted no effect concentration
DNEL: derived no effect level
TLV (ceiling value): threshold limit value
STEL: short-term exposure limit
EU-OEL: European occupational exposure limit
TWA: time-weighted average
ERV: Ecotoxicity Reference Values
EC: effective concentration
NOAEL: no observed adverse effect level
LC: lethal concentration
NOEC: no observed effect concentration
LOEC: lowest observed effect concentration
Bw: body weight
Koc: organic carbon-water partition coefficient

Main references and data sources

ECHA's data bank on registered substances and soon to be registered substances:
<http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances>

Adequate training for workers in order to ensure the protection of human health and the environment

- Chemical Risk Training pursuant to Legislative Decree 81/08 Title IX dangerous substances
- PPE training