Safety data sheet
According to Regulation n. 1907/2006 and Regulation 830/2015
SALT AG 806‰
Silver cyanide (Ag 80,6%)

Revision n. VII dd 01.21.2019
Replaces revision n VI dd 06.29.2017

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

1.1 Product Identifier

Chemical name	Silver cyanide (Ag 80,6%)
C.A.S. Registry Number	506-64-9
EINECS number	208-048-6
Molecular weight	133,8 g/mol
Chemical Formula	AgCN
Commercial name	Silver salt

1.2 Pertinent use of the substance and recommended use

For industrial uses and for electroplating

1.3 Informations about the furniture 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: Tel. 0557947819 Centro Antiveleni di Firenze

1.5 Registration number

For this product is not available a registration number as the annual produced or imported quantity is below one ton.

2. HAZARDS IDENTIFICATION

2.1 Classification of the mixture in accordance with Regulation (CE) n. 1272/2008

Hazard classes	Category codes	Hazard statements
Met. Corr.	1	H290
Acute tox	3	H301
Skin irrit.	2	H315
Eye Dam.	1	H318
Aquatic acute	1	H400
Aquatic chronic	1	H410

2.2 Label elements

Pittogrammi

Warnings **DANGER**

Hazard statements

H290	May be corrosive to metals
H301	Toxic if swallowed
H315	Causes skin irritation
H318	Causes serious eye damage
H410	Very toxic to aquatic life with long lasting effects

	EUH032	Contact with acids liberates very toxic gas
Safety Advice	P273	Avoid release to the environment
	P280	Wear protective gloves/protective clothing/eye protection/face protection
	P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.
	P301+P310	IF SWALLOWED: Immediately call a POISON CENTER
	P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing
	P302+P352	IF ON SKIN: Wash with plenty of water

- **Futher Informations** In combination with ammonia nitrate of silver can form unstable compounds such as silver fulminate
- **Results of PBT e vPvB** **PBT :** not applicable
  vPvB : not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

CAS number	506-64-9
EINECS number	208-048-6
CE number	-
IUPAC number	-

4. FIRST-AID MEASURES

4.1 Description of the first-aid measures

Inhalation	In the event of aerosol, mist, dusts or fumes formation it is possible an inhalation. No mouth to mouth resuscitation or mouth to nose. Use equipment for artificial respiration. Danger of poisoning. Maintain the respiratory disease clean. If not breathing provide artificial respiration or oxygen. Call immediately a doctor for medical treatment (keyword: poisoning/ hydrogen cyanide)
Ingestion	Consult a doctor immediately for medical treatment. Rinse out mouth. Give plenty of water. Induce vomiting (keyword: poisoning/ hydrogen cyanide).
Skin contact	If the skin dry and without injury it is in contact with dry sodium cyanide or potassium, we have not observed intoxication. After contact with skin, wash with soap and water. With symptoms of poisoning immediately alarmed the doctor (keyword: poisoning/hydrogen cyanide).
Eye contact	The use of special cleaning solutions with high buffering capacity (b.p. solution of borate buffer, diftoterine etc.) are recommended as part of first aid measures. Keeping the eye open, thoroughly rinse immediately with plenty of water for

at least 10 minutes. With symptoms of poisoning immediately alarmed the doctor (keyword: poisoning/hydrogen cyanide).

Recommendations:

- **Need for immediate medical attention** YES
- **Possibility of delayed effects subsequent the exposition** YES
- **Move the exposed individual from the area to fresh air** YES
- **Remove clothes and shoes from the individual** YES
- **Modality of manipulation of contaminated garments** With gloves
- **For lenders of first aid, wear the DPI** YES

4.2 Main symptoms and effects both acute and delayed

Possible signs of poisoning: It seems appropriate to differentiate between two stages:
1. Slight poisoning
2. Severe poisoning

The following symptoms do not provide reliable indications on prognosis.
Symptoms of central nervous system
Early stage: headache, dizziness, drowsiness, nausea.
Advanced stage: convulsions, coma.
Pulmonary symptoms
Early stage: dyspnea, tachypnea.
Advanced stage: hyperventilation, Cheyne-Stokes respiration, apnea.
Cardiovascular symptoms
Early stage: Hypertonia, arrhythmias of the sinus node, AV nodal arrhythmia, bradycardia.
Advanced stage: tachycardia, complex arrhythmias, cardiac arrest.
Skin symptoms
Early stage: Colourful red.
Advanced stage: cyanosis.
Effect on the metabolism: to pH 7.1 by lactate acidosis and lactate levels up to 17 mm / liter have been described.

4.3 Indication of the possible urgency to consult immediately a doctor or of special treatments

Therapy: Prevent the reabsorption and ensure vital functions, adhering strictly to self protection measures. Rapid treatment with antidotes can save lives and has previously about elimination of the poison.
Therapy: Slight poisoning. Artificial respiration with 100% oxygen. Depending on the symptoms and the clinical picture requires meticulous examination of reports, symptomatic treatment for pulmonary edema prophylaxis and diagnostics (lung X-rays).
Antidote therapy: for example administration of sodium thiosulfate 12.5 g - 100-500 mg / kg intravenous, according to the clinical finding and symptoms.
Warning! The assay is valid for a 70 kg adult. Each person poisoned by cyanide must be monitored continuously for many hours even if the patient feels well.
Therapy: severe intoxication.
Artificial respiration with oxygen. Immediate administration of antidote.
The medicines listed below may be used for the therapy with antidote:

Overall trainer
Administer hydroxocobalamin (Cyanokit®) 5g intravenous (70 mg / kg for adults) infusion for a period of 20-30 minutes. This dosage may be repeated, according to the severity of intoxication. The infusion period, for the repeated administration is 30 minutes up to 2 hours. The hydroxocobalamin can be administered only intravenously.
2. Cobalt Acetate (Kelocyanor®) 300 mg (1 ampoule) for adults in 1-3 minutes, by intravenous route.
Trainer methemoglobin:
1. 4-dimethylaminophenol, (4-Dmap) sodium thiosulfate: the antidote is administered in the following order:
a. -DMAP, 250 mg (3-4 mg per kg of body weight) in 5 ml IV (vial) followed by
b. 12.5 g of sodium thiosulphate in 50 ml IV infusion.
If the antidote was administered and the diagnosis is not that of cyanide intoxication and you have methemoglobin> 30%, you can be administered toluidine blue or methylene blue, to suspend the effect of cyanide antidote.
CAUTION: that should be done with extreme caution and only in the hospital, because of the renewed cyanide emissions in the blood.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media	alkaline extinguishing powder
Unsuitable extinguishing media	water, carbon dioxide (CO2), foam, Fire acid material, fire powders acids

5.2 Special hazards arising from the substance or the mixture

In case of fire can be released hydrogen cyanide

5.3 Advice for firefighters

General informations: Avoid that the water used to extinguish the fire goes into sewage system, aquifers or to superficial waters.

Equipment: Normal garments for firefighting, as an air breathing apparatus (ref. standard EN 137) or fresh air hose breathing, protective clothing for welding (EN 469), flame resistant gloves (EN659) and fireman's boots (HOA29 or A30)

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Get away immediately from the contaminated area.

6.1.2. For emergency responders

Use:
Half mask with ABEK2P3 filters, complying with EN14387:2004
Protective gloves which are EN 455-1 and EN 455-2-compliant or equivalent
Safety eyewear complying with 89/686/CEE and EN166:2001 regulation
Complete clothing with chimical protection, complying with UNI EN13034:2006 type 6 regulation

6.2 Environmental precautions

Prevent product from going into sewers and water sources or soil. In case of pollution of rivers, lakes or drains, inform appropriate authorities in accordance with local laws. In case of fire fire-fighting water should not enter in drainage systems, soil, or surface water. In case of fire, remove the endangered containers and bring them to a safe place, if you can do it safely

6.3 Methods and materials for containment and clean-up

6.3.1. Recommendations about the methods of containment of a spill

Close (if it is possible) or cover discharges

6.3.2. Recommendations about the methods of reclamation of a spill

solid substance:
Collect mechanically. Collect in suitable containers. The collected material should be reused according to regulations. To absorb spilled substance, it is recommended to use an approved industrial vacuum cleaner.
solution:
Absorb with material that holds liquids, for example: inert absorbent, diatomaceous earth or absorbent for acid. Collect mechanically. Collect in suitable containers. The collected material should be reused or disposed of according to regulations.

6.3.3. Any other informations

The substance, packaging, fire-fighting water and the remains of any fire should be taken to an appropriate disposal facility, respecting the rules on waste

6.4 Reference to other sections

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7. HANDLING AND STORAGE

7.1. Preacautions for safe handling

7.1.1. Recommendations that allow safe handling of the substance or mixture, such as containment and measures to prevent fine as well as aerosol and dust generation

Who manipulates substances must be in possession of a license enabling the use of toxic gases (cyanide). Avoid dust generation and keep away from incompatible materials (acids, acid salts, aluminum). Use only under intake hood. Keep fire extinguisher nearby and containment means such as inert absorbent materials, diatomaceous earth or absorbent for acids.

7.1.2. Advice on general occupational hygiene

Do not eat, drink or smoke in designated work areas. Wash hands after handling. To remove contaminated clothing and protective equipment before entering eating areas

7.2. Conditions for safe storage, including any incompatibilities

7.2.1. Risk management decisions arising from explosive atmospheres, corrosive conditions, flammability hazards, incompatible materials, evaporative conditions, potential ignition sources

The product itself does not burn, but if involved in a fire can release toxic gases.
Suitable containers: Plastic
In case of hydrogen cyanide liberation: it is possible the generation of

dust / air mixtures flammable or explosive.
Keep extinguisher nearby and plenty of water. Open containers under suction and close it immediately after use.

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

Keep in a ventilated locked room. Protect against solar radiation and the action of heat.

7.2.4. Conditions to maintain the integrity of the substance or mixture

Store in original container. Keep containers tightly closed and store in a dry and well ventilated, clean and lockable place

7.2.5. Decisions about ventilation requirements, specific design for storage rooms or vessels, quantitative limits in storage conditions , compatibility of the packaging.

Do not store close to acids and acid salts.
Keep the deposited substances locked up and with forced ventilation.
Use ADR approved packaging. When stored in quantities of 50 kg must be in possession of the authorization to the custody and conservation issued by the Commission Gas Toxic and must be held in an authorized cabin with forced ventilation

7.3. Specific end use

Preparation and formulation of galvanic baths

8. EXPOSURE CONTROL/ INDIVIDUAL PROTECTION

8.1. Controller parameters

(As Potassium cyanide CAS 151-50-8 EC 205-792-3)
Controller parameters: 5 mg/m3 Limit value (OEL (IT))
Observations: source for the limit values : ACGIH
Controller parameters: Skin designation : (OEL (IT))
It can be absorbed through the skin.
Suitable measurement methods are:
Potassium cyanide : OSHA method ID120
NIOSH method 7904
Hydrogen cyanide: OSHA method ID120

8.2. Exposure controls

Provide to a release of air at workplace and on the operating machine.
Install an emergency shower and an eye shower

8.2.1. Appropriate engineering controls

It is possible to consider the installation of a system for monitoring fugitive emissions of hydrogen cyanide in the working area.

8.2.2. Individual measures, such as personal protective equipment

Eye/face protection	Protective glasses complying with 89/686/CEE and EN166:2001 regulation
Skin protection (hands)	Protective gloves material: - natural rubber (NR) Material thickness 0.5 mm Break through time ≥ 480 min Method DIN EN 374 - Nitrile Material thickness 0.11 mm

		-penetration time ≥ 480 min Method DIN EN 374 - Nitrile Material thickness 0:33 mm penetration time ≥ 480 min MetodoDIN EN374 - Polychloroprene with natural latex liner material thickness 0.6 mm penetration time ≥ 480 min Method DIN EN 374
	Skin protection (body)	Complete clothing with chimical protection, comply with UNI EN13034:2006 type 6 regulation
	Respiratory protection	When hydrogen cyanide appears wear self-contained breathing apparatus. Observe the maximum times of use of respiratory protection. When dusts/aerosol appear: Respirator with combination filter B-P3 Respirator with combination filter ABEK-P3
	Thermal hazards	None

8.2.3. Environmental exposure controls

Prevent the spillage of cyanide-containing solutions in groundwater, soil, sewage. Provide for the closure of manholes during the displacement of the solutions. Do not store supplies in areas sewage.

9. PROPERTIES (PHYSICAL/CHEMICAL)

9.1 Informations about the main physical and chemical properties

Aspect	White and solid
Odour	No smell when it is dry
Odour threshold	Data are not available
pH	Data are not available
Melting point/freezing point	Decomposes
Intial boiling point and boiling range	Undefined
Flashpoint	Not flammable
Evaporation rate	Not applicable
Flammability solids/gases	Not flammable
Upper/lower flammability or explosive limits	Not applicable
Vapour pressure	Not applicable
Vapour density	Not applicable
Relative density	3.95 g/cm3(20°)
Solubility/Solubilities	Slightly soluble in cold water
The log octanol/water partition Coefficient	Not applicable
Auto-ignition temperature	Not applicable
Decomposition temperature	320 °C

	Viscosity	Not applicable
	Explosive properties	Not explosive
	Oxidising properties	Not oxidising

9.2. Other informations (miscibility, solubility, fat solubility, conductivity, redox potential, radical formation potential and photocatalytic properties)

None

10. STABILITY AND REACTIVITY

10.1 Reactivity

Risk of hydrocyanic acid formation in contact with acids, carbon dioxide, air humidity.

10.2 Chemical stability

The product is stable during normal storage and usage conditions

10.3 Possibility of hazardous reactions

The hydrogen cyanide is formed by heating above 300 ° C

10.4 Conditions to avoid

Under the action of acids can be released hydrocyanic acid, that it is flammable and with air can generate a mixture of explosive gases. Avoid contact with acid salts.

10.5 Incompatible materials

Acids, acid salts. With time, even the air can lead to the formation of hydrogen cyanide in a closed environment or in containers not hermetically sealed.

10.6 Hazardous decomposition products

HCN hydrogen cyanide (hydrocyanic acid)

11. TOXICOLOGICAL INFORMATION

11.1 Informations about toxicological effects

Acute toxicity orally	LD50 rat: 7,49 mg / kg Method: literature
Acute inhalation toxicity	Data are not available
Acute dermal toxicity	LD50 rabbit: 33 mg / kg Method: literature
Skin irritation	The irritating effect on skin can not be determined as a result of acute dermal toxicity
Eye irritation (rabbit)	Irritating Method:literature
Sensitisation	Data are not available
Repeated dose toxicity	Oral Rat: 75 ppm Testing period: 11.5 months Organ recipient / effect: no artifact due to the treatment, no increased frequency of tumors, brain, thyroid gland. Method: Literature national studies Oral rat Testing period: 90 days

		NOAEL: ca. 0.3 mg / kg Organ recipient / effect: reproductive organs Substance to be tested: sodium cyanide Drinking water study Sub-chronic toxicity Oral mouse NOAEL: ca. 16.2 mg / kg Organ recipient / effect: reproductive organs
	Skin corrosion/irritation	Causes skin irritation
	Eye damage/irritation	Causes serious eye damage
	Skin sensitisation or corrosion/irritation	Data are not available
	Germ cell mutagenicity	Not mutagenic
	Carcinogenity	Data are not available
	Reproductive toxicity	Not toxic for reproduction
	Specific target organ toxicity (STOT)-single exposure	Data are not available
	Specific target organ toxicity (STOT)-repeated exposure	Data are not available
	Aspiration hazard	Inspiration (enough ca. 200 ppm HCN atmospheric air) or ingestion (ca 200-300 mg KCN) can result in the immediate loss of consciousness and death

11.2 **Specific target organ toxicity**
It can be absorbed by the skin, especially if the skin is sweaty or wound

11.3 **Symptoms related to the physical, chemical and toxicological characteristic**
Shortness of breath, unconsciousness

11.4. **Delayed, immediate and chronic effects from short and long term exposure**
The inhalation and ingestion may result in death. In case of long-term exposure limit (15 ppm) have been described individual cases of disorders of thyroid function.

11.5. **Interactive effects**
There are no specific known effects

11.6. **In the absence of specific data**
Not applicable

11.7. **Other informations**
Related to substance: hydrogen cyanide epidemiological studies with workers exposed (1-3 ppm) showed no adverse health effects

12. **ECOLOGICAL INFORMATIONS**
Fish toxicity CL50 Oncorhynchus mykiss:

	0,042 mg/l / 96h Method: literature Salvelinus fontinalis : 0,011 mg/l 144 days Method: literature Reproduction WALNUT Salvelinus fontinalis: 0.006 mg / l /144 days
Toxicity for daphnia	Method: Literature CE50 Daphnia magna: 0,041 mg/l / 48h EC50 Daphnia magna: 0,041 mg / l / 48h Substance to be tested: 2-hydroxy-2-metilpropionitrile Method: US-EPA
Algae toxicity	EC 10 Daphnia Moina spec .: 0.022 mg / l / 5 days Method: literature IC 10 Scenedesmus acuminatus: 0.03 mg / l/ 8 days Method: Chronic literature
Toxicity living organisms	Lumbriculus variegatus EC50: 11 mg / l / 96 h in the ground Method: literature
Terrestrial plant toxicity	Terrestrial plants EC50: 22.4 mg / l Testing period: 32 days Method: Literature
Toxicity other non-mammals	birds: moderate Substance to be tested: sodium cyanide Lymnaea luteola EC50: 2.5 mg / l / 96 days Method: Literature Plecoptera EC50: 0.43 mg / l / 96giorni Method: Literature
Bacteria toxicity	EC 10 Pseudomonas putida: 0.001 mg / l / 16 h Method: literature Activated sludge EC50: 0.6 mg / l / h 0.5 Method: 87/302 / EEC EC 10 Uronema parduczi: 0.27

	mg / l / 20h
Persistence and degradability	Method: Literature Abiotic degradation: Hydrolysis Result: Potentially biodegradable
Bioaccumulation potential	Bioconcentration factor (BCF): 0.30
Mobility in soil	Logic: (Air): High Related to substance: hydrogen cyanide Logic (soil): Possible absorption
Results of PBT e vPvB	Data are not available
Other adverse effects	None

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

This product and its packaging must be disposed of in licensed facilities. It must be attributed a CER code of hazardous waste based on the provisions of the Directive 2008/98 / EC and subsequent amendments and additions. The packaging and labeling of waste must be identical to that of the pure product. Do not remove the labels from the packaging until their final destination. Do not reuse empty containers. The cyanide waste can only be treated and decontaminated by licensed companies with: Hydrogen peroxide and pH 11.

14. TRANSPORT INFORMATIONS

ONU number	1684
Name	Silver cyanide
Hazard class	6.1 toxic
Pack group	II
Environmental hazards	dangerous for the environment
Special precautions for user	approved packaging

15. REGULATORY INFORMATION

15.1 **Legislation**	**Applicability**
Reg. (CE) 1907/2006/CE Reach	YES
Reg. (CE) 1272/2008 CLP and subsequent amendments and addenda	YES
Reg. (CE) 2037/2000 "Substances that deplete the ozone layer"	NO
Reg. (CE) 850/2004 "The persistent organic pollutants"	NO
Reg. (CE) 689/2008 "The export and import of dangerous chemicals"	NO
Substance listed in Annex I 2012/18/UE cd Seveso	YES
D.lgs 81/2008 Uniform Occupational Health and Safety Code	YES
DirettivE 2014/103/UE "Adr"	YES

15.2 **Chemical Safety Assessment**

A chemical safety assessment has not been carried out

16. **OTHER INFORMATIONS**

16.1 **Changes as compared to the previous version**

Modified sections 1 and 2.

16.2 **Legend to abbreviations and acronyms**

ADR: European Agreement on the international carriage of goods by road
GHS: Globally Harmonised System of Classification and Labelling
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstract Service

16.3 **Bibliographical references and data sources**

ECHA substance data bank:
http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances

Platform ESIS

http://esis.jrc.ec.europa.eu

16.5. **Advice on any training appropriate for workers to ensure protection of human health and the environment**

- Training sessions on Chemical Risk pursuant to Legislative Decree 81/08 Title IX hazardous substances
- Training sessions on DPI
- Training for obtaining driver's license toxic gases manipulation

16.6. **. Other informations**

Not available