

## Section 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifiers

Trade name: Lead-free alloys (SnCu, SnCuAg, SnAgCu, SnAg)

TIN SILVER SOFT SOLDER ALLOYS [Sn96,3Ag3,7; Sn97Ag3; Sn96,5Ag3,5; Sn95Ag5]

TIN SILVER COPPER SOFT SOLDER ALLOYS (Sn99Cu0,7Ag0,3; Sn95Cu4Ag1; Sn92Cu6Ag2; Sn96,5Ag3Cu0,5; Sn95,8Ag3,5Cu0,7; Sn95,5Ag3,8Cu0,7; Sn95,5Ag4Cu0,5; Sn98,3Ag1Cu0,7)

TIN COPPER SOFT SOLDER ALLOYS (Sn99,3Cu0,7; Sn97Cu3; Sn96Cu4; Sn95Cu5)

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

**RELEVANT IDENTIFIED USES:**

Product used for soft manual and automatic soldering.

**USES ADVISED AGAINST:**

Not determined

### 1.3 Details of the supplier of the safety data sheet

**SUPPLIER:**

Cynel-Unipress Sp z o.o.

**ADDRESS:**

ul. Białołęcka 231B, 03-253 Warszawa, Poland

**TELEPHONE/FAX NUMBER:**

+48 22 519 29 48/ 22 519 29 46

**E-MAIL ADDRESS:**

marketing@cynel.com.pl

### 1.4 Emergency telephone number

Emergency Phone in Poland (open: 8.00 a.m.-4.00 p.m.)

+48 22 519 29 48 or +48 22 519 29 49

## Section 2: Hazards identification

### 2.1 Classification of the substance or mixture

**CLASSIFICATION ACCORDING TO REGULATION (EC) No 1272/2008**

None

**HARMFUL EFFECTS OF HUMAN HEALTH EFFECTS:**

If you use rightly, does not pose a threat to the human health

**EFFECTS OF OPERATION ON THE ENVIRONMENT:**

If you use rightly, does not pose a threat to the environment.

**EFFECTS OF ACTION RELATED TO PHYSICOCHEMICAL PROPERTIES:**

Not applicable

## 2.2 Label elements

**HAZARD SYMBOLS:**

None

**SUBSTANCE NAME FOR LABELING:**

Not applicable

**RISK PHRASES:**

None

**SAFETY PHRASES:**

None

**OTHER INFORMATION:**

None

## 2.3 Other hazards

The criteria for PBT or vPvB according to Annex XIII of Regulation REACH do not apply to inorganic substances.

## Section 3: Composition/Information on ingredients

### 3.1 Substances

Not applicable

### 3.2 Mixtures:

**TIN (Sn):**

Range of percentages:	91,30 – 99,50 %
CAS number:	7440-31-5
EC number:	231-141-8
Registration number:	01-2119486474-28-0000
Classification acc. to 1272/2008/EC:	not classified

Substance with defined value of the permissible concentration in the working environment at Community level.

**COPPER (Cu):**

Range of percentages:	0,00 – 6,50 %
CAS number:	7440-50-8
EC number:	231-159-6
Registration number:	01-2119480154-42-0045
Classification acc. to 1272/2008/EC:	not classified

Substance with defined value of the permissible concentration in the working environment at Community level.

**SILVER (Ag):**

Range of percentages: 0,00 – 5,20 %  
CAS number: 7440-22-4  
EC number: 231-100-4  
Registration number: 01-2119555669-21-0029  
Classification acc. to 1272/2008/EC: not classified  
Substance with defined value of the permissible concentration in the working environment at Community level.

Full text of each relevant H phrase is given in section 16.

## Section 4: First aid measures

### 4.1 Description of first aid measures

**GENERAL INFORMATION:**

at room temperature (outside of the dangers of a mechanical nature). But in the process of soldering the main risks are: high temperature, solder fumes and vapours.

During production and some uses, the hazardous respirable silver-bearing particles may occur/be formed.

In case of health problems, immediately contact to a doctor or poison control center. Please check vital functions. If victim is unconscious, please provide adequate ventilation. Prevent the victim from cooling down.

**SKIN CONTACT:**

Solder alloy: In case of exposure wash the affected skin thoroughly with soap and water.

In the process of soldering: possible thermal burn. Rinse damaged skin with cold water. Apply a sterile dressing. Consult with the doctor.

**EYE CONTACT:**

Solder alloy: if filings get into the eyes, immediately rinse with plenty of water with the eyelids wide open, for at least 10-15 min. Consult an ophthalmologist.

In the process of soldering: In the process of soldering: splashes of molten metal can cause burns. Apply a sterile dressing. Immediately consult an ophthalmologist.

**INGESTION:**

Rinse mouth with water. Do not induce vomiting without medical advice. Consult a physician.

The form of the product causes that exposure is unlikely. Consume the product may be a consequence of not following basic hygiene rules, e.g. washing hands after work or exposure to high concentrations of dust and fumes in the workplace.

**INHALATION:**

Wire: exposure not possible.

In the process of soldering: take the affected person to fresh air and obtain medical ensure help.

## 4.2 Most important symptoms and effects, both acute and delayed

Prolonged exposure on dust/fume cause metallic taste in mouth, loss of appetite, headache and general weakness. It can also cause bluish or grayish discoloration of the skin, eyes and mucous membranes (argyria). It occurs slowly, it may take several years before it develops. These stains are irreversible.

Gastro-intestinal symptoms are the first symptoms for high oral intakes of soluble copper compounds. Vomiting may occur. The most critical organ for delayed effects from “copper” excess is the liver. Nose-lung irritation may be a symptom occurring after inhalation of copper containing fumes/dusts/mists.

### EYE CONTACT:

may cause irritation, redness, tearing.

### SKIN CONTACT:

may cause redness, burning sensation, bumps (during soldering).

### INHALATION:

irritation of respiratory tract, cough, headaches and dizziness. Symptoms of exposure may only appear after a few days.

### INGESTION:

Gastro-intestinal symptoms are the first symptoms for high oral intakes of soluble mixture. Swallowing of silver compounds may cause irritation of the gastrointestinal tract.

## 4.3 Indication of any immediate medical attention and special treatment needed

A decision regarding further medical treatment by a physician should be made after thorough examination of the injured.

## Section 5: Firefighting measures

### 5.1 Extinguishing media

#### SUITABLE EXTINGUISHING MEDIA:

extinguishing powder, sand

Extinguishing with extinguishing powders or sand promotes the limitation of the release of toxic fumes of metals.

#### UNSUITABLE EXTINGUISHING MEDIA:

CO<sub>2</sub>, foam, water jet – risk of the propagation of the flame

### 5.2 Special hazards arising from the substance or mixture

Non-combustible product. During the combustion at > 400° C may be create products with toxic and irritating fumes contains copper, silver and tin. Do not inhale combustion products – it can be dangerous to health.

### 5.3 Advice for firefighters

Personal protection typical in case of fire. Self-contained breathing apparatus and protective clothing should be worn.

## Section 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Limit the access to the breakdown area for the outsiders, until the suitable cleaning operations are completed. Use personal protective equipment. Ensure that the consequences of failure are removed by trained personnel only. Do not inhale dust. Avoid direct contact with the product. There must be adequate ventilation. Wear a face mask if the ventilation is insufficient.

#### FOR NON-EMERGENCY PERSONNEL

Use protective clothing made of natural materials (cotton) or synthetic fibers, gloves made of nitrile. Use safety goggles. Do not inhale dust, smoke, vapour. Remove sources of ignition. . Ensure that the consequences of failure are removed by trained personnel only.

#### FOR EMERGENCY RESPONDERS

Use protective clothing made of natural materials (cotton) or synthetic fibers. Use full safety mask. Do not inhale dust, smoke, vapour. Remove sources of ignition. Mark the contamination of the area.

### 6.2 Environmental precautions

Prevent entry into drains, surface and ground water and soil. In case of release of large amounts of the product, notify the appropriate emergency services.

### 6.3 Methods and material for containment and cleaning up

Pick it up mechanically. Avoid dust formation during collection. The waste must be collected and transported in sealed container. Treat collected material like a waste or reuse it. Hand over the waste to waste management companies.

### 6.4 Reference to other sections

Appropriate conduct with waste product – section 13

Appropriate personal protective clothing – section 8

## Section 7: Handling and storage

### 7.1 Precautions for safe handling

Handle in accordance with good occupational hygiene and safety practices Before break and after work wash hands carefully. Avoid contact with eyes and skin. Do not breathe fumes in the process of soldering. Ensure proper ventilation during soldering process. Do not eat, drink and smoke during the handling. Avoid creating dust in the workplace. Use as intended. Wear personal protective equipment.

[In accordance with COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (Official Journal of the European Union No L.132 of 29.05.2015)]

## 7.2 Including any incompatibilities

Keep in properly labeled original packaging. Keep in a dry and well-ventilated place. Keep away from strong acids and oxidants. Store at temp. 5-30°C. The recommended humidity level of 20-80%. Keep away from food and beverages.

## 7.3 Specific end uses

Applications are listed in section 1.2.

## Section 8: Exposure controls/personal protection

### 8.1 Control parameters

MAXIMUM ADMISSIBLE CONCENTRATIONS AND INTENSITIES FOR AGENTS HARMFUL TO HEALTH IN THE WORKING ENVIRONMENT IN POLAND, Dz.U. 2018 POZ. 1286

Specification	NDS [mg/m <sup>3</sup> ]	NDSch [mg/m <sup>3</sup> ]	NDSP [mg/m <sup>3</sup> ]	Number of fibers [cm <sup>2</sup> ]	Remark
Tin and its inorganic compounds - fume and dust	2,00	—	—	—	—
Other non-polluting industrial dusts	10	—	—	—	—
Copper and its inorganic compounds	0,20	—	—	—	—
Silver - inhalation fraction <sup>1</sup>	0,05	—	—	—	—
Silver - insoluble compounds - calculated as Ag	0,05	—	—	—	—
Silver - soluble compounds - calculated as Ag	0,01	—	—	—	—

- 1) Inhalation fraction - aerosol penetration through the nose and mouth, which, when deposited in the respiratory tract, poses a health risk according to PN-EN 481.
- 2) Labeling the substance with the term "skin" means that the absorption of substances through the skin can be just as important as with inhalation

LIST OF MAK AND BAT VALUES 2018 COMMISSION FOR THE INVESTIGATION OF HEALTH HAZARDS OF CHEMICAL COMPOUNDS IN THE WORK AREA

Specification	MAK [ppm]	MAK [mg/m <sup>3</sup> ]	Peak limitation	Pregnancy risk group
Tin and its inorganic compounds	see Section IIb		—	—
Copper and its inorganic compounds	—	0,01 R	II (2)	C
Silver	—	0,1 I	II (8)	D

R measured as the respirable fraction of the aerosol (see Section Vd p. 206)  
I measured as the inhalable fraction of the aerosol

[In accordance with COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (Official Journal of the European Union No L.132 of 29.05.2015)]

THE FOLLOWING CURRENT NATIONAL OCCUPATIONAL EXPOSURE LIMIT VALUES APPLY (EUROPEAN UNION):

Specification	TLV-TWA [mg/m <sup>3</sup> ] *	TLV-STEL [mg/m <sup>3</sup> ]
Silver, metallic	0,10	—
Silver (soluble compounds as Ag)	0,01	—

\* Measured or calculated in relation to a reference period of eight hours as a time-weighted average.

Please check also any national occupational exposure limit values in your country.

Follow the procedures for monitoring the concentrations of hazardous components in the air and the procedures for the control of air quality in the workplace - as long as they are available and reasonable on a given workplace - according to the relevant European Standards. Take into account the conditions at the site of exposure and appropriate measurement methodology adapted to working conditions.

INHALATION DNELS (LONG-TERM AND ACUTE EFFECTS):

Worekrs	
Soluble silver compound	0,01 * mg Ag/m <sup>3</sup>
Poorly / insoluble silver compound	0,1 ** mg Ag/m <sup>3</sup>
General population	
Soluble silver compound	0,004 * mg Ag/m <sup>3</sup>
Poorly / insoluble silver compound	0,04 * mg Ag/m <sup>3</sup>

\* Value for re-calculation only

\*\* Value applicable to the substance "silver metal"

ORAL DNELS (LONG-TERM EFFECTS):

General population	
Soluble silver compound	0,02 * mg Ag/m <sup>3</sup>
Poorly / insoluble silver compound	1,2 ** mg Ag/m <sup>3</sup>
Children	
Soluble silver compound	0,002 * mg Ag/m <sup>3</sup>
Poorly / insoluble silver compound	0,12 * mg Ag/m <sup>3</sup>

\* Value for re-calculation only

\*\* Value applicable to the substance "silver metal"

[In accordance with COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (Official Journal of the European Union No L.132 of 29.05.2015)]

## DNEL OF TIN AND COPPER

	Copper	Tin
<b>Workers</b>		
<b>Hazard via inhalation route, SYSTEMIC EFFECTS, Long term exposure</b>		
Hazard assessment conclusion:	no hazard identified	71 mg/m <sup>3</sup>
Most sensitive endpoint:	repeated dose toxicity	repeated dose toxicity
<b>Hazard via dermal route, SYSTEMIC EFFECTS, Long term exposure</b>		
Hazard assessment conclusion:	137 mg/kg bw/day	10 mg/kg bw/day
Most sensitive endpoint:	repeated dose toxicity	repeated dose toxicity
<b>Hazard for the eyes</b>		
Hazard assessment conclusion:	no hazard identified	no hazard identified
<b>General Population</b>		
<b>Hazard via inhalation route, SYSTEMIC EFFECTS, Long term exposure</b>		
Hazard assessment conclusion:	no hazard identified	17 mg/m <sup>3</sup>
Most sensitive endpoint:	repeated dose toxicity	repeated dose toxicity
<b>Hazard via dermal route, SYSTEMIC EFFECTS, Long term exposure</b>		
Hazard assessment conclusion:	137 mg/kg bw/day	80 mg/kg bw/day
Most sensitive endpoint:	repeated dose toxicity	repeated dose toxicity
<b>Hazard via oral route, SYSTEMIC EFFECTS, Long term exposure</b>		
Hazard assessment conclusion:	0,041 mg/kg bw/day	5 mg/kg bw/day
Most sensitive endpoint:	repeated dose toxicity	repeated dose toxicity
<b>Hazard for the eyes</b>		
Hazard assessment conclusion:	low hazard (no threshold derived)	no hazard identified

## PNEC FOR COPPER

PNEC	Value	time of exposure
<b>PNEC aqua – freshwater</b>	7,8 µg/L	short-term (single case)
<b>PNEC aqua - marine water</b>	5,2 µg/L	short-term (single case)
<b>PNEC sewage treatment plant (STP)</b>	230 µg/L	short-term (single case)
<b>PNEC freshwater sediment</b>	87 mg/kg	short-term (single case)
<b>PNEC sea sediment</b>	676 mg/kg	short-term (single case)
<b>PNEC soil</b>	65 mg/kg	short-term (single case)



## 8.2 Exposure controls

### APPROPRIATE ENGINEERING CONTROLS

Ensure adequate general and local ventilation. In case of insufficient ventilation use respiratory protection. When handling do not eat, drink, take medicine and smoke. Before break and after work carefully wash hands. Avoid dusting. Avoid contact with skin, eyes and inhalation of dust, fumes and vapors produced during processing of the product.

Employer is obliged to ensure equipment adequate to activities carried out, with quality demands, cleaning and maintenance.

### INDIVIDUAL PROTECTION MEASURES, SUCH AS PERSONAL PROTECTIVE EQUIPMENT

#### Respiratory protection

In the event of exceedances of limit values use respiratory protection with filter type P1 or depending on the concentration exceeded (P2, P3)

If you work in closed spaces or where there is a risk of an uncontrolled expansion use insulating respiratory protective equipment.

#### Skin, hand and body protection

Use protective clothing made of natural materials (cotton) or synthetic fibers, gloves made of nitrile or latex (thickness  $0,4 \pm 0,05$  mm, breakthrough time > 60 min)

#### Eye protection

Use safety goggles that protect against splatter during soldering.

Handle in accordance with good industrial hygiene and safety procedures. Do not allow the crossing of the environment, the work place concentration limits for hazardous constituents.

After work, remove soiled clothing. Wash hands and face thoroughly after handling product, before eating, smoking and at the end of the working period. Do not eat, drink or smoke when working.

### ENVIRONMENTAL EXPOSURE CONTROLS

Prevent entry into sewage collection system and watercourses.

## Section 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Appearance:	solid, gray
Odour:	odorless
Odour threshold:	not determined
pH:	not applicable
Melting point/freezing point:	
for Sn96,3Ag3,7 ; Sn97Ag3 ; Sn96,5Ag3,5 ; Sn95Ag5:	221 - 240 °C
for Sn99Cu0,7Ag0,3 ; Sn95Cu4Ag1 ; Sn92Cu6Ag2:	217 - 380 °C
for Sn96,3Ag3Cu0,5 ; Sn95,8Ag3,5Cu0,7:	
Sn95,5Ag3,8Cu0,7 ; Sn95,5Ag4Cu0,5 ; Sn98,3Ag1Cu0,7:	217 - 224 °C
for Sn99,3Cu0,7 ; Sn97Cu3 ; Sn96Cu4 ; Sn95Cu5:	227 - 310 °C

[In accordance with COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (Official Journal of the European Union No L.132 of 29.05.2015)]

Initial boiling point and boiling range:	not determined
Flash point:	not applicable
Evaporation rate:	not applicable
Flammability (solid, gas):	not flammable
Upper/lower flammability or explosive limits:	not applicable
Vapour pressure:	not determinate
Vapour density:	not determined
Relative density:	
for Sn96,3Ag3,7 ; Sn97Ag3 ; Sn96,5Ag3,5 ; Sn95Ag5:	7,35 – 7,40 g/cm <sup>3</sup>
for Sn99Cu0,7Ag0,3 ; Sn95Cu4Ag1 ; Sn92Cu6Ag2:	7,30 – 7,40 g/cm <sup>3</sup>
for: Sn96,3Ag3Cu0,5 ; Sn95,8Ag3,5Cu0,7	
Sn95,5Ag3,8Cu0,7 ; Sn95,5Ag4Cu0,5 ; Sn98,3Ag1Cu0,7:	7,30 – 7,45 g/cm <sup>3</sup>
for Sn99,3Cu0,7 ; Sn97Cu3 ; Sn96Cu4 ; Sn95Cu5	7,30 – 7,35 g/cm <sup>3</sup>
Solubility(ies):	not soluble in water
Partition coefficient: n-octanol/water:	not determined
Auto-ignition temperature:	no self-ignition
Decomposition temperature:	not determined
Viscosity:	not applicable
Explosive properties:	Not exploding.
Oxidising properties	not applicable

## 9.2 Other safety information

No data

## Section 10: Stability and reactivity

### 10.1 Reactivity

Under normal conditions of storage and use, hazardous decomposition products not be reactivity

### 10.2 Chemical stability

The product is stable under normal conditions.

### 10.3 Possibility of hazardous reactions

In contact with incompatible materials reacts violently with emission of heat.

### 10.4 Conditions to avoid

Extreme temperature and humidity.

### 10.5 Incompatible materials

Strong oxidizing agents, bases and acids (nitric acid, hot sulfuric acid, hydrogen sulfide)

### 10.6 Hazardous decomposition products

None under normal conditions of use and storage.

## Section 11: Toxicological information

### 11.1 Information on toxicological effects

#### TOXICITY OF MIXTURE

Based on available data, the classification criteria are not met.

#### TOXICITY OF COMPOUNDS:

##### *Tin*

LD50 (oral, rat) > 2 000 mg/kg

LD50 (skin, rat) > 2 000 mg/kg

LC50 (inhalation, rat) > 4,75 mg/l/4h

In the form of dust or fumes is irritating. May cause shortness of breath, fever, general weakness, sweating, remitting without treatment (so-called smoke-induced fever metals). Dusts may cause mechanical irritation of the conjunctiva with tearing, pain, congestion.

##### *Silver*

Lethal and toxic doses and concentrations:

LD50 (rat, oral): > 2 000 mg/kg bm. (silver)

LD50 (rat, oral): 3702 mg/kg bm. (Ag2O)

#### SKIN CORROSION/IRRITATION

based on available data, the classification criteria are not met

#### SERIOUS EYE DAMAGE/IRRITATION

based on available data, the classification criteria are not met

#### RESPIRATORY OR SKIN SENSITISATION

based on available data, the classification criteria are not met

#### GERM CELL MUTAGENICITY

based on available data, the classification criteria are not met

#### CARCINOGENICITY

based on available data, the classification criteria are not met

#### REPRODUCTIVE TOXICITY

based on available data, the classification criteria are not met

#### STOT-SINGLE EXPOSURE

based on available data, the classification criteria are not met

#### STOT-REPEATED EXPOSURE

based on available data, the classification criteria are not met

#### ASPIRATION HAZARD

based on available data, the classification criteria are not met

#### HEALTH EFFECTS OF LOCAL EXPOSURE

##### *Skin contact:*

may cause redness, dry skin, burning sensation, blurs (during soldering)

**Eye contact:**

may cause irritation, redness, tearing.

**Ingestion:**

may cause stomach disorders (nausea, vomiting, abdominal pain)

**Inhalation:**

may cause cough, headaches and dizziness

## Section 12: Ecological information

### 12.1 Toxicity

No specific toxicity test results. This product is not classified as dangerous for the environment.

**Silver:**Fish:

Acute toxicity:

LC50 (96 h), Pimephales promelas: 1.2 µg Ag /L

LC50 (96 h), Oncorhynchus mykiss: 1.48 µg Ag /L

LC50 (96 h), Salmo gairdneri: 6.5 µg Ag /L (soft water)

LC50 (96 h), Salmo gairdneri: 13 µg Ag /L (hard water)

Chronic toxicity:

EC10 (217 d), Salmo trutta: 0.19 µg Ag/L

EC10 (217 d), Salmo trutta: 1.23 µg Ag/L

EC10 (196 d), Oncorhynchus mykiss: 0.17 µg Ag/L

NOEC (32 d), Pimephales promelas: 0.351 µg Ag/L (growth inhibition)

EC10 (32 d), Pimephales promelas: 0.39 µg Ag/L (growth inhibition)

EC10 (32 d), Pimephales promelas: 0.44 µg Ag/L (lethality)

Crustaceans:

Acute toxicity:

LC50 (48 h), Daphnia magna: 0.22 µg Ag/L

LC50 (48 h), Ceriodaphnia dubia: 0.76 µg Ag/L

Chronic toxicity:

EC10 (7 d), Ceriodaphnia dubia: 2.48 µg Ag/L (effects on reproduction)

EC10 (21 d), Daphnia magna: 2.14 µg Ag/L (growth inhibition)

NOEC (7 d), Ceriodaphnia reticulata: 1 µg Ag/L (effects on reproduction)

Algae:

Acute toxicity:

EC10 (24 h), Chlamydomonas reinhardtii : 0.54 µg Ag/L (growth inhibition)

EC10 (24 h), Pseudokirchneriella subcapitata: 0.41 µg Ag/L (growth inhibition)

Chronic toxicity:

NOEC (14 d), Champia parvula: 1.2 µg Ag/L

Predicted No-Effect Concentrations:

PNEC (freshwater): 0.04 µg/L

PNEC (marine water): 0.86 µg/L

PNEC (freshwater sediment): 1.2 mg/kg sediment (dry mass)

PNEC (marine water sediment): 1.2 mg/kg sediment (dry mass)

## 12.2 Persistence and degradability

Not biodegradable.

## 12.3 Bioaccumulative potential

Not determined for mixture

According to the Chemical Safety Report for silver on silver bioaccumulation in living organisms there are several test results available on a variety of organisms. To develop silver safety assessment the study carried out on carp (*Cyprinus carpio*) was taken into account, in which the fish were exposed to approx. 0.2 mg Ag/L for 30 days. Bioconcentration factor (BCF) i.e. concentration coefficient of the substance (in this case silver) in the body in relation to its concentration in the surrounding aqueous environment for carp was 70. The BCF in fish of  $\geq 500$  is an indicative of the ability to bioconcentration.

## 12.4 Mobility in soil

Poorly mobile in soil and aquatic environment. Heavier than water, sinks to the bottom and remains here.

Silver ions react in the soil with  $\text{CO}_3^{2-}$ ,  $\text{S}^{2-}$ ,  $\text{SO}_3^{2-}$ ,  $\text{Cl}^-$  forming very slightly water-soluble compounds, therefore, they remain in the top layer of soil.

## 12.5 Results of PBT and vPvB assessment

Does not apply to inorganic substances

## 12.6 Other adverse effects

This product has no influence on the global warming or the ozone layer depletion.

Silver is toxic to freshwater fish, as it causes abnormal sodium and chloride transport through membranes of gills cells. It is one of the most toxic metals for bacteria.

## Section 13: Disposal considerations

### 13.1 Waste treatment methods

The one introducing hazardous agents in packages is obliged to organize the collection system and ensure recycling including the recycling of hazardous agents packaging. The one introducing hazardous agents performs above duties on their own or by agreement with local government.

#### SPECIAL PRECAUTIONS:

Dispose of this material safely.

#### DISPOSAL METHODS FOR THE PRODUCT:

Do not dispose of the product together with domestic waste, do not release to sewage system. Do not allow contamination of groundwater and surface water. Recommended way of disposing of waste: recycling.

#### DISPOSAL METHODS FOR USED PACKAGING:

Contaminated packaging (after a thorough emptying) and unused product to pass to the designated recipient of waste.

## Section 14: Transport information

### 14.1 UN number

Not applicable, product is not classified as hazardous in transportation.

### 14.2 UN proper shipping name

Not applicable.

### 14.3 Transport hazard class(es)

Not applicable.

### 14.4 Packaging group

Not applicable.

### 14.5 Environmental hazards

Not classified as dangerous for the environment.

### 14.6 Special precautions for user

Not necessary.

### 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

## Section 15: Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

1. REGULATION (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

2. REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 with later changes (adaptation to technical and scientific progress 1-13 ATP)

3. DIRECTIVE 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations

4. Commission Regulation (EC) No 790/2009 of 10 August 2009 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures

[In accordance with COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (Official Journal of the European Union No L.132 of 29.05.2015)]

5. Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
6. Council Directive 91/689/EEC of 12 December 1991 on hazardous waste
7. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives
8. European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste
9. European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), concluded in Geneva on 30 September 1957 (Dz. U. Nr 110, poz. 641).
10. List of MAK and BAT Values 2018 Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area
11. Regulation of the Minister of Labour and Social Policy of 12 June 2018 on Maximum Permissible Concentration and Intensity of Agents Harmful to Health in the Working Environment (Dz.U. 2018 poz. 1286)
12. European Commission Employment, Social Affairs & Inclusion Health and Safety at work – The Scientific Committee on Occupational Exposure Limits (SCOEL)

## 15.2 Chemical Safety Assessment

There is no data on the safety assessment for chemical substances contained in the mixture.

## Section 16: Other information

### TRAININGS

Before commencing working with the product, the user should learn the Health & Safety regulations regarding handling chemicals, and in particular undergo proper workplace training.

### EXPLANATION OF ABBREVIATIONS AND ACRONYMS

PEL	Permissible Exposure Limit
PBT	Persistent, Bioaccumulative and Toxic substance
vPvB	very Persistent, very Bioaccumulative substance
DNEL	Derived No Effect Level
PNEC	Predicted No Effect Concentration
LD50	lethal dose is an indication of the lethal toxicity of a given substance or type of radiation.
LC50	lethal concentration
EC50	Half maximal effective concentration
EC10	effect concentration - substance concentration expressed in milligrams per litre causing the given pharmacological effect (e.g. inhibition of growth) at 10% of the examined population within specified time.
CAS	unique numerical identifier assigned by Chemical Abstracts Service
WE	unique seven-digit identifier that was assigned to substances for regulatory purposes within the European Union by the European Commission
NDS/MAK	The highest acceptable concentration

[In accordance with COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (Official Journal of the European Union No L.132 of 29.05.2015)]

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NDSch	The highest permissible instantaneous concentration
NDSP	Concentration value of toxic chemical or dust
TLV-TWA	the highest admissible concentration/threshold limit value – weighted average value – concentration of toxic chemical whose impact on a worker during 8-hour daily shift and average weekly time of work provided in the Labour Code during the period of his occupational activity should not cause negative changes of his health condition and of health condition of his next generations.
TLV-STEL	the highest admissible short term concentration/short term exposure limit – weighted average of concentration of the specified, toxic chemical compound which should not cause negative changes of a worker's health if present in the work environment for not longer than 15 minutes and not more often than twice per shift with occurrences separated by more than 1 hour
BCF	bioconcentration factor

The information above is based on a current available data concerning the product, but also on the experience and knowledge of the producer in this field. It is neither a quality description of the product nor a guarantee of particular features. It is to be treated as aid to safety in transport, storage and usage of the product. That does not free the user from the responsibility for improper usage of the information above and also of improper compliance with the legal norms in the field.

Other data Classification of the substances based on the information from ECHA. Classification of mixture was prepared based on the data concerning the contents of dangerous components using calculation method based on the Regulation (EC) No 1272/2008 (CLP).

The information contained in the SDS is to describe the product only in terms of safety requirements. The user is the one responsible for creating conditions for the safe use of the product, and assumes the responsibility for the consequences resulting from improper use of this product.