

**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

· **Trade name:** **Silberoxid 93% Ag**  
**Silver oxide 93% Ag**

· **Article number:** 4020510101

· **CAS Number:**  
20667-12-3

· **EC number:**  
243-957-1

· **Registration number** 01-2119513370-54

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

SU8 Manufacture of bulk, large scale chemicals (including petroleum products)

SU9 Manufacture of fine chemicals

SU15 Manufacture of fabricated metal products, except machinery and equipment

SU16 Manufacture of computer, electronic and optical products, electrical equipment

**Product category**

PC0 Other

PC8 Biocidal products

PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents

PC21 Laboratory chemicals

PC37 Water treatment chemicals

**Process category**

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

PROC4 Chemical production where opportunity for exposure arises

PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

PROC14 Tableting, compression, extrusion, pelletisation, granulation

PROC21 Low energy manipulation and handling of substances bound in/on materials or articles

PROC22 Manufacturing and processing of minerals and/or metals at substantially elevated temperature

PROC26 Handling of solid inorganic substances at ambient temperature

**Environmental release category**

ERC1 Manufacture of the substance

ERC2 Formulation into mixture

ERC5 Use at industrial site leading to inclusion into/onto article

ERC6a Use of intermediate

ERC10a Widespread use of articles with low release (outdoor)

ERC11a Widespread use of articles with low release (indoor)

**Article category**

AC1 Vehicles

AC2 Machinery, mechanical appliances, electrical/electronic articles

AC3 Electrical batteries and accumulators

AC7 Metal articles

**Application of the substance / the mixture**

Initial product for chemical reactions

Galvanic bath

**1.3 Details of the supplier of the safety data sheet****Manufacturer/Supplier:**

Wieland Edelmetalle GmbH

Schwenninger Str. 13

75179 Pforzheim

Telefon +49 (07231)-1393-0, Telefax +49 (07231)-1393-100

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· **Further information obtainable from:**

Wieland Edelmetalle GmbH  
www.wieland-edelmetalle.de  
msds@wieland-edelmetalle.de

· **1.4 Emergency telephone number:**

Emergency CONTACT (24-Hour-Number): GBK GmbH +49 (0)6132-84463

**SECTION 2: Hazards identification**

· **2.1 Classification of the substance or mixture**

· **Classification according to Regulation (EC) No 1272/2008**



GHS03 flame over circle

Ox. Sol. 1            H271 May cause fire or explosion; strong oxidiser.



GHS05 corrosion

Eye Dam. 1            H318 Causes serious eye damage.



GHS09 environment

Aquatic Acute 1    H400 Very toxic to aquatic life.

Aquatic Chronic 1 H410 Very toxic to aquatic life with long lasting effects.

· **2.2 Label elements**

· **Labelling according to Regulation (EC) No 1272/2008**

The substance is classified and labelled according to the CLP regulation.

· **Hazard pictograms**



GHS03



GHS05



GHS09

· **Signal word** Danger

· **Hazard-determining components of labelling:**

disilver oxide

· **Hazard statements**

H271 May cause fire or explosion; strong oxidiser.

H318 Causes serious eye damage.

H410 Very toxic to aquatic life with long lasting effects.

· **Precautionary statements**

P210            Keep away from heat. - No smoking.

P221            Take any precaution to avoid mixing with combustibles.

P283            Wear fire/flame resistant/retardant clothing.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310            Immediately call a POISON CENTER/doctor.

P501            Dispose of contents/container in accordance with local/regional/national/international regulations.

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- **2.3 Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

### SECTION 3: Composition/information on ingredients

- **3.1 Chemical characterisation: Substances**
- **CAS No. Description**  
20667-12-3 disilver oxide
- **Identification number(s)**
- **EC number:** 243-957-1

### SECTION 4: First aid measures

- **4.1 Description of first aid measures**
- **General information:** Immediately remove any clothing soiled by the product.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:**  
Immediately wash with water and soap and rinse thoroughly.  
If skin irritation continues, consult a doctor.
- **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
- **After swallowing:** Do not induce vomiting; call for medical help immediately.
- **4.2 Most important symptoms and effects, both acute and delayed**  
No further relevant information available.
- **4.3 Indication of any immediate medical attention and special treatment needed**  
No further relevant information available.

### SECTION 5: Firefighting measures

- **5.1 Extinguishing media**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **5.2 Special hazards arising from the substance or mixture** No further relevant information available.
- **5.3 Advice for firefighters**
- **Protective equipment:** Wear self-contained respiratory protective device.
- **Additional information**  
Collect contaminated fire fighting water separately. It must not enter the sewage system.

### SECTION 6: Accidental release measures

- **6.1 Personal precautions, protective equipment and emergency procedures**  
Avoid formation of dust.  
Ensure adequate ventilation
- **6.2 Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **6.3 Methods and material for containment and cleaning up:**  
Pick up mechanically.  
Send for recovery or disposal in suitable receptacles.
- **6.4 Reference to other sections** See Section 13 for disposal information.

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### SECTION 7: Handling and storage

- **7.1 Precautions for safe handling** Prevent formation of dust.
- **Information about fire - and explosion protection:** No special measures required.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:** Store away from flammable substances.
- **Further information about storage conditions:**  
 Protect from heat and direct sunlight.  
 Protect from exposure to the light.
- **Storage class:** 5.1 B
- **7.3 Specific end use(s)** No further relevant information available.

### SECTION 8: Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.

#### 8.1 Control parameters

- **Ingredients with limit values that require monitoring at the workplace:**

#### 20667-12-3 disilver oxide

WEL	Long-term value: 0.01 mg/m <sup>3</sup> as Ag
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#### · PNECs

#### 20667-12-3 disilver oxide

PNEC <sub>freshwater</sub>	0.04 µg/l (-) (Soluble Ag)
PNEC <sub>marine</sub>	0.86 µg/l (-) (Soluble Ag)
PNEC <sub>sediment freshw.</sub>	438 mg/kg dwt (-) (Ag)
PNEC <sub>sediment marine</sub>	438 mg/kg dwt (-) (Ag)
PNEC <sub>soil</sub>	0.794 mg/kg wwt (-) (Ag)
PNEC <sub>STP</sub>	0.025 mg/l (-) (Soluble Ag)

- **Additional information:** The lists valid during the making were used as basis.

#### 8.2 Exposure controls

##### · Personal protective equipment:

##### · General protective and hygienic measures:

- Immediately remove all soiled and contaminated clothing
- Wash hands before breaks and at the end of work.
- Avoid contact with the eyes.

##### · Respiratory protection:

- Use suitable respiratory protective device in case of insufficient ventilation.
- Filter P2

##### · Protection of hands:



Protective gloves

##### · Material of gloves

- Chloroprene rubber, CR
- Butyl rubber, BR
- Fluorocarbon rubber (Viton)
- Nitrile rubber, NBR

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- **Penetration time of glove material**  
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

- **Eye protection:**



Tightly sealed goggles

- **Body protection:** Protective work clothing

### SECTION 9: Physical and chemical properties

- **9.1 Information on basic physical and chemical properties**

- **General Information**

- **Appearance:**

<b>Form:</b>	Powder
<b>Colour:</b>	Dark brown
<b>Odour:</b>	Odourless

- **pH-value:** Not applicable

- **Change in condition**

<b>Melting point/freezing point:</b>	> 200 °C
<b>Initial boiling point and boiling range:</b>	Undetermined.

- **Flash point:** Not applicable.

- **Flammability (solid, gas):** Contact with combustible material may cause fire.

- **Ignition temperature:** Not applicable

- **Decomposition temperature:** > 200 °C

- **Explosive properties:** Product does not present an explosion hazard.

- **Vapour pressure:** Not applicable

- **Density at 20 °C:** 7.2 g/cm<sup>3</sup>

- **Bulk density at 20 °C:** 950 kg/m<sup>3</sup>

- **Solubility in / Miscibility with**

<b>water:</b>	Insoluble.
<b>Organic solvents:</b>	0.0 %

**Solids content:** 100.0 %

- **9.2 Other information** No further relevant information available.

### SECTION 10: Stability and reactivity

- **10.1 Reactivity** No further relevant information available.

- **10.2 Chemical stability**

- **Thermal decomposition / conditions to be avoided:** To avoid thermal decomposition do not overheat.

- **10.3 Possibility of hazardous reactions**

Reacts with powdered metals.

Exothermic reaction.

- **10.4 Conditions to avoid** No further relevant information available.

- **10.5 Incompatible materials:** No further relevant information available.

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· **10.6 Hazardous decomposition products:** No dangerous decomposition products known.

### SECTION 11: Toxicological information

· **11.1 Information on toxicological effects**

· **Acute toxicity** Based on available data, the classification criteria are not met.

· **LD/LC50 values relevant for classification:**

**20667-12-3 disilver oxide**

Oral	LD50	3,804 mg/kg (rat)
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· **Primary irritant effect:**

· **Skin corrosion/irritation** Based on available data, the classification criteria are not met.

· **Serious eye damage/irritation**

Causes serious eye damage.

· **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.

· **Repeated dose toxicity**

**20667-12-3 disilver oxide**

Oral	Repeat dose tox.	30 mg/kg bw/d (rat) (with silver nanomaterial)
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· **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**

· **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.

### SECTION 12: Ecological information

· **12.1 Toxicity**

· **Aquatic toxicity:**

**20667-12-3 disilver oxide**

LC50	0.331 mg/l (96h) ( <i>Oligocottus maculosus</i> ) (marine)
	0.0012 mg/l (96h) ( <i>Pimephales promelas</i> (fathead minnow )) (freshwater)
EC10	0.17 µg/l (196d) ( <i>Onchorhynchus mykiss</i> (rainbow trout)) (freshwater)
EC10	0.41 µg/l (24h) ( <i>Pseudokirchneriella subcapitata</i> (algae))
EC50	0.00022 mg/l (48h) ( <i>Daphnia magna</i> (water flea)) (freshwater)
EC50	0.0071 mg/l (48h) ( <i>Acartia tonsa</i> (calanoid copepod)) (marine)
NOEC	130 µg/l (28d) ( <i>Menidia beryllina</i> (neotropical silversid)) (marine)
NOEC	1.2 µg/l (14d) ( <i>Champia parvula</i> (algae)) (marine)
NOEC	8.6 µg/l (30d) ( <i>Arbacia punctulata</i> (sea urchin)) (marine)
NOEC	1 µg/l (7d) ( <i>Ceriodaphnia reticulata</i> (water flea)) (freshwater)
NOEC (Sediment)	12 mg/kg dry weight ( <i>Hyalella azteca</i> ) (SEDIMENT)
EC10 (56d)	15.05 mg/kg soil dry ( <i>Eisenia fetida</i> ) (SOIL)
EC10 (17d)	0.13 mg/kg soil dry ( <i>Lactuca sativa</i> ) (SOIL)
EC10 (28d)	0.3 mg/kg soil dry (microorganisms) (SOIL)

· **12.2 Persistence and degradability** No further relevant information available.

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· **12.3 Bioaccumulative potential**

**20667-12-3 disilver oxide**

Oral BCF 70 (Cyprinus carpio) (Test material: Silver Cyanid)

· **12.4 Mobility in soil** No further relevant information available.

· **Additional ecological information:**

· **General notes:**

Water hazard class 2 (German Regulation) (Assessment by list): hazardous for water

Do not allow product to reach ground water, water course or sewage system.

Danger to drinking water if even small quantities leak into the ground.

· **12.5 Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **12.6 Other adverse effects** No further relevant information available.

### SECTION 13: Disposal considerations

· **13.1 Waste treatment methods**

· **Recommendation**

Contact manufacturer for recycling information.

Must be specially treated adhering to official regulations.

· **Uncleaned packaging:**

· **Recommendation:**

Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

Packagings that may not be cleansed are to be disposed of in the same manner as the product.

· **Recommended cleansing agents:** Water, if necessary together with cleansing agents.

### SECTION 14: Transport information

· **14.1 UN-Number**

· **ADR, IMDG, IATA**

UN1479

· **14.2 UN proper shipping name**

· **ADR**

1479 OXIDIZING SOLID, N.O.S. (disilver oxide), ENVIRONMENTALLY HAZARDOUS

· **IMDG**

OXIDIZING SOLID, N.O.S. (disilver oxide), MARINE POLLUTANT

· **IATA**

OXIDIZING SOLID, N.O.S. (disilver oxide)

· **14.3 Transport hazard class(es)**

· **ADR**



· **Class**

5.1 (O2) Oxidising substances.

· **Label**

5.1

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**· IMDG**


· **Class** 5.1 Oxidising substances.  
· **Label** 5.1

**· IATA**


· **Class** 5.1 Oxidising substances.  
· **Label** 5.1

· **14.4 Packing group**  
· **ADR, IMDG, IATA**

II

**· 14.5 Environmental hazards:**

· **Marine pollutant:** No  
Symbol (fish and tree)  
· **Special marking (ADR):** Symbol (fish and tree)

**· 14.6 Special precautions for user**

Warning: Oxidising substances.

**· Danger code (Kemler):**

5.1

**· EMS Number:**

F-A,S-Q

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

Not applicable.

**· Transport/Additional information:**
**· ADR**

· **Limited quantities (LQ)** 1 kg  
· **Transport category** 2  
· **Tunnel restriction code** E

**· UN "Model Regulation":**

UN1479, OXIDIZING SOLID, N.O.S. (disilver oxide), ENVIRONMENTALLY HAZARDOUS, 5.1, II

### SECTION 15: Regulatory information

**· 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
**· Directive 2012/18/EU**

· **Named dangerous substances - ANNEX I** Substance is not listed.

**· Seveso category**

P8 OXIDISING LIQUIDS AND SOLIDS

E1 Hazardous to the Aquatic Environment

· **Qualifying quantity (tonnes) for the application of lower-tier requirements** 50 t

· **Qualifying quantity (tonnes) for the application of upper-tier requirements** 200 t

**· National regulations:**

· **Waterhazard class:** Water hazard class 2 (Assessment by list): hazardous for water.

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· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

## SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** Abteilung Umweltschutz

· **Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organisation

ICAO-TI: Technical Instructions by the "International Civil Aviation Organisation" (ICAO)

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

PNEC: Predicted No-Effect Concentration (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Ox. Sol. 1: Oxidizing solids – Category 1

Eye Dam. 1: Serious eye damage/eye irritation – Category 1

Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1

Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1

· **\* Data compared to the previous version altered.**

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