

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



**Silver oxide ≥99%, p.a.**

article number: **5309**  
Version: **GHS 3.0 en**  
Replaces version of: 2022-05-18  
Version: (GHS 2)

date of compilation: 2018-02-20  
Revision: 2024-03-03

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

### 1.1 Product identifier

Identification of the substance **Silver oxide ≥99%, p.a.**  
Article number 5309  
CAS number 20667-12-3

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

Relevant identified uses: Laboratory chemical  
Laboratory and analytical use  
Uses advised against: Do not use for private purposes (household).  
Food, drink and animal feedingstuffs.

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

Carl Roth GmbH + Co. KG  
Schoemperlenstr. 3-5  
D-76185 Karlsruhe  
Germany

**Telephone:**+49 (0) 721 - 56 06 0  
**Telefax:** +49 (0) 721 - 56 06 149  
**e-mail:** sicherheit@carlroth.de  
**Website:** www.carlroth.de

Competent person responsible for the safety data sheet: Department Health, Safety and Environment

**e-mail (competent person):** **sicherheit@carlroth.de**

### 1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
NSW Poisons Information Centre Childrens Hospital	Hawkesbury Road	2145 Westmead, NSW	131126	

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
2.14	Oxidising solid	1	Ox. Sol. 1	H271
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318

For full text of abbreviations: see SECTION 16

### 2.2 Label elements

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

## Labelling

### Signal word

Danger

### Pictograms

GHS03, GHS05



### Hazard statements

H271 May cause fire or explosion; strong oxidiser  
H318 Causes serious eye damage

### Precautionary statements

#### Precautionary statements - prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking  
P280 Wear eye protection/face protection  
P283 Wear fire/flame resistant/retardant clothing

#### Precautionary statements - response

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P306+P360 IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes  
P370+P378 In case of fire: Use sand, carbon dioxide or powder extinguisher for extinction  
P371+P380+P375 In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion

## 2.3 Other hazards

### Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

### Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Name of substance	Silver oxide
Molecular formula	$\text{Ag}_2\text{O}$
Molar mass	$231.7 \text{ g/mol}$
CAS No	20667-12-3

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

## SECTION 4: First aid measures

### 4.1 Description of first aid measures



#### General notes

Take off contaminated clothing.

#### Following inhalation

Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

#### Following skin contact

Rinse skin with water/shower. In all cases of doubt, or when symptoms persist, seek medical advice.

#### Following eye contact

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

#### Following ingestion

Rinse mouth. Call a doctor if you feel unwell.

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

Risk of blindness, Risk of serious damage to eyes, Irritation

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

none

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media



#### Suitable extinguishing media

co-ordinate firefighting measures to the fire surroundings!  
water, foam, dry extinguishing powder, ABC-powder

#### Unsuitable extinguishing media

water jet

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

Explosive when mixed with combustible material. Oxidising property. Non-combustible.

### 5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

## SECTION 6: Accidental release measures

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



#### For non-emergency personnel

Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe dust.

### 6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it. If substance has entered a water course or sewer, inform the responsible authority.

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

#### Advice on how to contain a spill

Covering of drains. Take up mechanically.

#### Advice on how to clean up a spill

Take up mechanically. Control of dust.

#### Other information relating to spills and releases

Place in appropriate containers for disposal.

### 6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Avoid dust formation.

#### Measures to prevent fire as well as aerosol and dust generation

Removal of dust deposits. Keep away from combustible material.

#### Advice on general occupational hygiene

Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs.

### 7.2 Conditions for safe storage, including any incompatibilities

Store in a dry place.

#### Incompatible substances or mixtures

Observe hints for combined storage. Keep/store away from clothing/combustible materials. Take any precaution to avoid mixing with combustibles.

#### Consideration of other advice:

#### Ventilation requirements

Use local and general ventilation.

#### Specific designs for storage rooms or vessels

Recommended storage temperature: 15 – 25 °C

### 7.3 Specific end use(s)

No information available.

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### National limit values

#### Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [mg/m <sup>3</sup> ]	STEL [mg/m <sup>3</sup> ]	Ceiling-C [mg/m <sup>3</sup> ]	Notation	Source
AU	nuisance dusts		WES	10			i	WES

#### Notation

Ceiling-C Ceiling value is a limit value above which exposure should not occur

i Inhalable fraction

STEL Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)

TWA Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

#### Human health values

Relevant DNELs and other threshold levels				
Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	0.107 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects

#### Environmental values

Relevant PNECs and other threshold levels				
Endpoint	Threshold level	Organism	Environmental compartment	Exposure time
PNEC	0.04 $\mu\text{g}/\text{l}$	aquatic organisms	freshwater	short-term (single instance)
PNEC	0.86 $\mu\text{g}/\text{l}$	aquatic organisms	marine water	short-term (single instance)
PNEC	0.025 $\text{mg}/\text{l}$	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
PNEC	438.1 $\text{mg}/\text{kg}$	aquatic organisms	freshwater sediment	short-term (single instance)
PNEC	438.1 $\text{mg}/\text{kg}$	aquatic organisms	marine sediment	short-term (single instance)
PNEC	1.41 $\text{mg}/\text{kg}$	terrestrial organisms	soil	short-term (single instance)

### 8.2 Exposure controls

#### Individual protection measures (personal protective equipment)

#### Eye/face protection



Use safety goggle with side protection.

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

## Skin protection



### • hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 °C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

### • type of material

NBR (Nitrile rubber)

### • material thickness

>0,11 mm

### • breakthrough times of the glove material

>480 minutes (permeation: level 6)

### • other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

## Respiratory protection



Respiratory protection necessary at: Dust formation. Particulate filter device (EN 143). P1 (filters at least 80 % of airborne particles, colour code: White).

## Environmental exposure controls

Keep away from drains, surface and ground water.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Physical state	solid
Form	powder
Colour	brown - black
Odour	odourless
Melting point/freezing point	~230 °C
Boiling point or initial boiling point and boiling range	not determined
Flammability	non-combustible
Lower and upper explosion limit	not determined

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



**Silver oxide  $\geq 99\%$ , p.a.**

article number: **5309**

Flash point	not applicable
Auto-ignition temperature	not determined
Decomposition temperature	130 °C
pH (value)	not applicable
Kinematic viscosity	not relevant
<u>Solubility(ies)</u>	
Water solubility	(practically insoluble)
<u>Partition coefficient</u>	
Partition coefficient n-octanol/water (log value):	not relevant (inorganic)
Vapour pressure	not determined
<u>Density and/or relative density</u>	
Density	7.2 g/cm <sup>3</sup> at 20 °C
Relative vapour density	Information on this property is not available.
Bulk density	~950 kg/m <sup>3</sup>
Particle characteristics	No data available.
<u>Other safety parameters</u>	
Oxidising properties	

## 9.2 Other information

Information with regard to physical hazard classes:	There is no additional information.
Other safety characteristics:	There is no additional information.

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

It's a reactive substance. Oxidising property.

### 10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

### 10.3 Possibility of hazardous reactions

**Violent reaction with:** Combustible materials, Magnesium, Phosphorus, Reducing agents, Sulphur, Selenium, Alcohol,

**Danger of explosion:** Sodium, Acetylene, Ammonia (NH<sub>3</sub>), Ammonium hydroxide, Ethanol, Hydrazine, Aluminium-Powder, Carbon monoxide

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

## 10.4 Conditions to avoid

Keep away from heat. Decomposition takes place from temperatures above: 130 °C.

## 10.5 Incompatible materials

aluminium, combustible materials

## 10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Classification acc. to GHS

#### Acute toxicity

Shall not be classified as acutely toxic.

GHS of the United Nations, annex 4. May be harmful if swallowed or in contact with skin.

Acute toxicity					
Exposure route	Endpoint	Value	Species	Method	Source
oral	LD50	>2,000 mg/kg	rat		ECHA
dermal	LD50	>2,000 mg/kg	rat		ECHA

#### Skin corrosion/irritation

Shall not be classified as corrosive/irritant to skin.

#### Serious eye damage/eye irritation

Causes serious eye damage.

#### Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

#### Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

#### Carcinogenicity

Shall not be classified as carcinogenic.

#### Reproductive toxicity

Shall not be classified as a reproductive toxicant.

#### Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

#### Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

#### Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

#### Symptoms related to the physical, chemical and toxicological characteristics

##### • If swallowed

If swallowed danger of perforation of the esophagus and the stomach (strong corrosive effects)



# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

- **If in eyes**

Causes serious eye damage, risk of blindness

- **If inhaled**

breathing difficulties, Irritating to respiratory system

- **If on skin**

strongly irritant

- **Other information**

none

## 11.2 Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

## SECTION 12: Ecological information

### 12.1 Toxicity

Very toxic to aquatic life with long lasting effects.

Aquatic toxicity (acute)				
Endpoint	Value	Species	Source	Exposure time
LC50	1.2 $\mu\text{g}/\text{l}$	fish	ECHA	96 h

Aquatic toxicity (chronic)				
Endpoint	Value	Species	Source	Exposure time
EC50	0.8 $\mu\text{g}/\text{l}$	aquatic invertebrates	ECHA	7 d

### 12.2 Persistence and degradability

Data are not available.

### 12.3 Bioaccumulative potential

Does not significantly accumulate in organisms.

BCF	70 (ECHA)
-----	-----------

### 12.4 Mobility in soil

Data are not available.

### 12.5 Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

### 12.6 Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of  $\geq 0,1\%$ .

### 12.7 Other adverse effects

Data are not available.

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods



This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

#### Sewage disposal-relevant information

Do not empty into drains.

#### Waste treatment of containers/packagings

Only packagings which are approved (e.g. acc. to the Dangerous Goods Regulations) may be used. Handle contaminated packages in the same way as the substance itself. Completely emptied packages can be recycled.

#### Relevant provisions relating to waste(Basel Convention)

#### Properties of waste which render it hazardous

H5.1 Oxidizing

### 13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions. Non-contaminated packages may be recycled.

## SECTION 14: Transport information

### 14.1 UN number

UN RTDG	UN 3085
IMDG-Code	UN 3085
ICAO-TI	UN 3085

### 14.2 UN proper shipping name

UN RTDG	OXIDIZING SOLID, CORROSIVE, N.O.S.
IMDG-Code	OXIDIZING SOLID, CORROSIVE, N.O.S.
ICAO-TI	Oxidizing solid, corrosive, n.o.s.
Technical name	Silver oxide

### 14.3 Transport hazard class(es)

UN RTDG	5.1 (8)
IMDG-Code	5.1 (8)
ICAO-TI	5.1 (8)

### 14.4 Packing group

UN RTDG	II
IMDG-Code	II
ICAO-TI	II

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

**14.5 Environmental hazards** hazardous to the aquatic environment

**14.6 Special precautions for user**

There is no additional information.

**14.7 Transport in bulk according to IMO instruments**

The cargo is not intended to be carried in bulk.

**14.8 Information for each of the UN Model Regulations**

**Transport information National regulations Additional information (UN RTDG)**

<b>UN number</b>	3085
<b>Class</b>	5.1
<b>Subsidiary risk(s)</b>	8
<b>Environmental hazards</b>	Yes Hazardous to the aquatic environment
<b>Packing group</b>	II
<b>Danger label(s)</b>	5.1+8 Fish and tree



**Special provisions (SP)** 274  
UN RTDG

**Excepted quantities (EQ)** E2  
UN RTDG

**Limited quantities (LQ)** 1 kg  
UN RTDG

**Emergency Action Code** 1W

**International Maritime Dangerous Goods Code (IMDG) - Additional information**

Proper shipping name	OXIDIZING SOLID, CORROSIVE, N.O.S.
Particulars in the shipper's declaration	UN3085, OXIDIZING SOLID, CORROSIVE, N.O.S., (Silver oxide), 5.1 (8), II, MARINE POLLUTANT
Marine pollutant	yes (hazardous to the aquatic environment)
Danger label(s)	5.1+8, "Fish and tree"



**Special provisions (SP)** 274

**Excepted quantities (EQ)** E2

**Limited quantities (LQ)** 1 kg

**EmS** F-A, S-Q

**Stowage category** B

# Safety data sheet Safety data sheet


acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

## International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Proper shipping name	Oxidizing solid, corrosive, n.o.s.
Particulars in the shipper's declaration	UN3085, Oxidizing solid, corrosive, n.o.s., (Silver oxide), 5.1 (8), II
Environmental hazards	YES (hazardous to the aquatic environment)
Danger label(s)	5.1+8
	
Special provisions (SP)	A3
Excepted quantities (EQ)	E2
Limited quantities (LQ)	2,5 kg

## SECTION 15: Regulatory information

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

There is no additional information.

#### National regulations(Australia)

##### Australian Inventory of Chemical Substances(AICS)

Substance is listed.

#### Other information

Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

#### National inventories

Country	Inventory	Status
AU	AIIC	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
JP	CSCL-ENCS	substance is listed
KR	KECI	substance is listed
MX	INSQ	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TW	TCSI	substance is listed
US	TSCA	substance is listed (ACTIVE)
VN	NCI	substance is listed

#### Legend

AIIC Australian Inventory of Industrial Chemicals  
CSCL-ENCS List of Existing and New Chemical Substances (CSCL-ENCS)

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

## Legend

DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
KECI	Korea Existing Chemicals Inventory
NCI	National Chemical Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

## 15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

## SECTION 16: Other information

### Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.3		Endocrine disrupting properties: Does not contain an endocrine disruptor (ED) at a concentration of $\geq 0,1\%$ .	yes
14.8		Emergency Action Code: 1W	yes
15.1		National inventories: change in the listing (table)	yes

### Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
BCF	Bioconcentration factor
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
ED	Endocrine disruptor
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air

# Safety data sheet Safety data sheet

acc. to Safe Work Australia - Code of Practice



Silver oxide  $\geq 99\%$ , p.a.

article number: 5309

Abbr.	Descriptions of used abbreviations
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
STEL	Short-term exposure limit
TWA	Time-weighted average
UN RTDG	UN Recommendations on the Transport of Dangerous Good
vPvB	Very Persistent and very Bioaccumulative
WES	Safe Work Australia: Workplace exposure standards for airborne contaminants

## Key literature references and sources for data

Safe Work Australia's Code of Practice for Labelling of Workplace Hazardous Chemicals (under WHS Regulations).

UN Recommendations on the Transport of Dangerous Good. International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

## List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H271	May cause fire or explosion; strong oxidiser.
H318	Causes serious eye damage.

## Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.