



ZnSe, crystalline

Version 3.0 / EN

Revision date:

09.01.2025

1. Identification of the substance and of the company

1.1 Product identifier

Product No.: 45 xx xxx
Substance name: Zinc selenide ZnSe, crystalline
EC No.: 215-259-7
REACH Registration No.: exempted from registration (Title II, Art.6, Par.1 REACH)
CAS No.: 1315-09-9

1.2 Relevant identified uses of the substance and uses advised against

Identified uses: Exceptionally as material for optical components.

1.3 Details of the supplier of the safety data sheet

KORTH KRISTALLE GMBH

Am Jägersberg 3

D-24161 Altenholz

GERMANY

Tel.: +49 (0)431 36905-0

Telefax: +49 (0)431 36905-25

E-Mail: info@korth.de

1.4 Emergency telephone number

Germany: GIFTNOTRUFZENTRALE-NORD Göttingen, 24h/7d

Tel.: +49-(0)551 19 240

Switzerland: TOX INFO SUISSE Zürich, 24h

Tel.: +41 44 251 51 51 (for Swiss : 145)

2. Hazards identification

2.1 Classification of the substance

2.1.1 According to Regulation (EC) 1272/2008 (CLP)

| | |
|--|-----------------|
| Classification: Acute toxicity oral | Category 3 H301 |
| Classification: Acute toxicity inhalation | Category 3 H331 |
| Classification: Specific target organ toxicity after repeated exposure | Category 2 H373 |
| Classification: Hazardous to the aquatic environment, acute | Category 1 H400 |
| Classification: Hazardous to the aquatic environment, chronic | Category 1 H410 |

2.1.2 Additional information

EUH032 Contact with acids liberates very toxic gases.

2.2 Label elements

Hazard pictograms:

Signal word:

Hazard statements:

H301
H331
H373
H410

Precautionary statements: P260

P264

P270

P273

P301+P310

P304+P312

Danger

Toxic if swallowed.

Toxic if inhaled.

May cause damage to organs through prolonged or repeated exposure.

Very toxic to aquatic life with long lasting effects.

Do not breathe dust/fume/vapours/gas/mist/sprays.

Wash hands and skin thoroughly after handling.

Do not eat, drink or smoke when using this product.

Avoid release to the environment.

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.





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2.3 Other hazards

Possibility of liberation of very toxic gas dihydrogen selenide H₂Se by the reaction of the substance with acids. The substance meets *not* the criteria for vPvB according to Annex XIII of the Regulation (EC) Nr.1907/2006 REACH.

The substance is *not* listed as substance of very high concern (SVHC) according to Annex XIV of the Regulation (EC) Nr.1907/2006 REACH.

The substance does *not* exhibit any endocrine¹⁾ disrupting components or properties according to Regulation (EU) 2017/2100.*

The substance is listed as dangerous substance according Annex VI, Table 3.1 of the Regulation (EUC) Nr.1272/2008 CLP-GHS.

The substance does *not* contain any substances relevant to RoHS according to the directive 2011/65/EU (RoHS 2) and the substance complement 2015/863 (EU) (RoHS 3).

¹⁾ Endocrine system: hormones system (https://en.wikipedia.org/wiki/Endocrine_system)

3. Composition / information on ingredients

3.1 Substances

| Name | Chemical formulae | Weight% content | CAS No. | (EC)EINECS No. | Index No. in CLP Annex VI | UN No. |
|---------------|-------------------|-----------------|-----------|----------------|---------------------------|--------|
| Zinc selenide | ZnSe | 100 | 1215-09-9 | 215-259-7 | 034-002-00-8 | 3283 |

4. First aid measures

4.1 Description of first aid measures

| | |
|--|---|
| <i>General notes:</i> | Consult doctor in event of any complaints. |
| <i>Following inhalation:</i> | Change location to fresh air. Consult a doctor. |
| <i>Following skin contact:</i> | Remove contaminated clothing and put it in a tight closing box. Wash off contacted area with plenty soap and water. Consult a doctor. |
| <i>Following eye contact:</i> | Rinse the open eye with ample streaming water. Consult an eye doctor for additional treatment. |
| <i>Following ingestion:</i> | Rinse mouth, spilling the liquid and give the person 2 cups water to drink, if not unconscious. Call a doctor. |
| <i>Self-protection of first aider:</i> | Suitable for avoiding contact with the substance. |

4.2 Most important symptoms and effects, both acute and delayed

Eye burning, scraping of skin (dermatitis) after prolonged contact, metallic taste and flowing cold ("Selenium cold"), cough and scrape in the neck after inhalation, sickness up to vomiting, dizziness, headache, forming of oedema of lungs, disturbance of the central nerve system, cardiac arrhythmia, damage of liver and kidney possible.

4.3 Indication of any immediate medical attention and special treatment needed

In case of ingestion creation of very toxic dihydrogen selenide in the stomach probable. Intoxication by selenium probably recognizable by metallic taste and garlic like smell of the breathable air. Application of BAL (*British Anti-Lewisite*: Dimercaprol) and Ca-EDTA as agents for detoxication not suited. Prophylaxis for oedema of lungs with glucocorticoids advised.

5. Firefighting measures

5.1 Extinguishing media

| | |
|--------------------------|---|
| <i>Suitable media:</i> | Spray water, foam, carbon dioxide (CO ₂), powder. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| <i>Unsuitable media:</i> | <i>none</i> |



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5.2 Special hazards arising from the substance

Hazardous combustion products: For temperatures >400°C creation of toxic/corrosive vapour of Zn, ZnO, Se, SeO₂, H₂Se (zinc, zinc oxide, selenium, selenium dioxide, dihydrogene selenide) possible.

5.3 Advise for firefighters

Usage of self-contained breathing apparatus is necessary. Wear suitable protective clothing and avoid contact with skin. Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

6. Accidental release measure

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Protective equipment: Suitable protective clothing and equipment.

Emergency procedures: Avoid generation and inhalation of dusts (dust respirator). Take care for appropriate fresh air. Avoid contact to eyes and skin.

6.1.2 For emergency responders

Use gloves for chemicals, e.g. PVA.

6.2 Environmental precautions

In the event of substance entering waters, canalization, or soil inform the administrative.

6.3 Methods and material for containment and cleaning up

6.3.1 For containment: Take up immediately and store in a tight closing box with labelling.

6.3.2 For cleaning up: Take up dry. Avoid generation of dust. Clean up with water.

6.3.3 Other information: none

6.4 Reference to other sections

Protective clothing according to CHAPTER 8, disposal according to CHAPTER 13.

7. Handling and storage

7.1 Precautions for safe handling

Protective measures:

Follow common safety and hygiene statements.

Measures to prevent fire:

Keep away from heat sources.

Measures to prevent aerosol

and dust generation:

Shelter from mechanical damage. Avoid generation of dust. In the case of dust generating work exhaustion system necessary.

Measures to protect the environment:

Remaining material should be collected in a container.

Advice on general occupational hygiene:

Rinse off hands thoroughly after contact.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions:

Only for people with expert knowledge. Keep away from food. Do not store together with acids and strong bases.

Packing materials:

Not critical.

Requirements for storage rooms and vessels:

Keep at dry, cool, well-ventilated place. The container should be kept tight closed and wear a label.

Storage class (VCI):

6.1D: Not combustible, acutely toxic cat.3 or chronic effects.



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Further information: none

7.3 Specific end uses

Optical material exclusive for the manufacture of optical components.

8. Exposure controls / personal protection

8.1 Control parameters

| SUBSTANCE: ZINC SELENIDE | | | | | | |
|--------------------------|--|---------------------------|---------------------------|---------------------------|-----------------------------|--------------|
| CAS NO: 1315-09-9 | | | | | | |
| Country | limit value - 8 hours | | limit value - short term* | | biological limit value mg/g | legal basis |
| | ppm | mg/m ³ | ppm | mg/m ³ | | |
| European Union | | <i>n.a.</i> ¹⁾ | | <i>n.a.</i> ¹⁾ | <i>n.a.</i> ¹⁾ | RL2000/39/EG |
| <i>Austria</i> | | 0,1 ¹⁾ | | 0,3 ²⁾ | <i>n.a.</i> ²⁾ | ASchG |
| <i>France</i> | | <i>n.a.</i> ¹⁾ | | <i>n.a.</i> ¹⁾ | <i>n.a.</i> ¹⁾ | |
| <i>Germany (AGS)</i> | | 0,05 ¹⁾ | | 0,05 ¹⁾ | <i>n.a.</i> ¹⁾ | GefStoffV |
| <i>Italy</i> | | <i>n.a.</i> ¹⁾ | | <i>n.a.</i> ¹⁾ | <i>n.a.</i> ¹⁾ | |
| <i>Norway</i> | | 0,05 ¹⁾ | | <i>n.a.</i> ²⁾ | <i>n.a.</i> ²⁾ | |
| <i>Spain</i> | | <i>n.a.</i> ¹⁾ | | <i>n.a.</i> ¹⁾ | <i>n.a.</i> ¹⁾ | |
| <i>United Kingdom</i> | | 0,1 ¹⁾ | | <i>n.a.</i> ²⁾ | <i>n.a.</i> ²⁾ | |
| Comments | | | | | | |
| European Union | ¹⁾ not available | | | | | |
| <i>Austria</i> | ¹⁾ breathable aerosol GKV register (2011), ²⁾ not available | | | | | |
| <i>France</i> | ¹⁾ not available | | | | | |
| <i>Germany (AGS)</i> | AGW value, ¹⁾ breathable fraction, inorganic selenium compounds, TRGS900 V.2006, ²⁾ selenium in serum (GESTIS data base) | | | | | |
| <i>Italy</i> | ¹⁾ not listed in GESTIS data base | | | | | |
| <i>Norway</i> | ¹⁾ listed in <i>Forskrift om tiltaksverdier og grenseverdier (Nr. 704), 08/2016</i> as Selen og uorg. selenforb. (beregnet som Se), ²⁾ not available | | | | | |
| <i>Spain</i> | ¹⁾ not available | | | | | |
| <i>United Kingdom</i> | ¹⁾ listed in <i>EH40/2005 Workplace exposure limits, 2.ed. 2011</i> as Selenium and compounds (as Se), ²⁾ not available | | | | | |
| | * „short term“ means 15 minutes, short term value = exceeding factor × AGW, if not otherwise quoted. | | | | | |



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| DNELs | | | |
|---|------------------|-----------|-----------------------|
| SUBSTANCE: ZINC SELENIDE CAS NO: 1315-09-9 | | | |
| Route of exposure | Effects | Person | Limit value |
| Oral | Acute systemic | Workers | |
| | | Costumers | |
| | Chronic systemic | Workers | |
| | | Costumers | |
| Dermal | Acute systemic | Workers | |
| | | Costumers | |
| | Chronic systemic | Workers | |
| | | Costumers | |
| Inhalation | Chronic systemic | Workers | 1,7 mg/m ³ |
| | | Costumers | 1,7 mg/m ³ |
| Comments | | | |
| | | | |

| PNECs | | | |
|---|-------|---------------|----------|
| SUBSTANCE: ZINC SELENIDE CAS NO: 1315-09-9 | | | |
| Environmental protection target | Value | Safety factor | Comments |
| Fresh water | | | |
| Freshwater sediments* | | | |
| Marine water | | | |
| Marine sediments* | | | |
| Food chain* | | | |
| Microorganisms in sewage treatment | | | |
| Soil (agricultural) | | | |
| Air* | | | |

8.2 Exposure controls

8.2.1 Appropriate engineering tools

Substance related measures

during identified uses:

Organisational measures:

Technical measures:

Just keep the necessary quantity at the working bench.

Annual instruction of workers. No violation of limit values. Pay attention to the administrative restrictions of employment of young people and pregnant workers.

Take care for appropriate fresh air or exhaustion system.

8.2.2 Personal protection equipment (PPE)

Eye and face protection:

Hand and skin protection:

Respiratory protection:

Thermal hazards:

Safety glasses.

Tight closing protective clothing. Gloves made of e.g. PVA. Remember skin care.

Protective devices required when dusts are generated. For short term dust generation breathing filter. For high concentration of dust usage of kombi filter (type B-P3, colour code: grey-white) is necessary.

not true

8.2.3 Environmental exposure controls

Substance related measures:

Just keep the necessary quantity at the place of usage.



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Instruction measures: Avoid entering the canalization. Use collection containers.
Organisational measures: Place the collection container at the place of usage.
Technical measures: No drain at the place of usage.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

| | |
|--|---------------------------------------|
| a) Appearance: | reddish/yellow, geometrical body |
| b) Odour: | without |
| c) Odour threshold: | <i>not true</i> |
| d) pH: | unknown |
| e) Melting point/freezing point: | 1.526°C |
| f) Initial boiling point and boiling range: | unknown |
| g) Flash point: | <i>not true</i> |
| h) Evaporation rate: | practically not existing (25°C) |
| i) Flammability (solid, gas): | not flammable |
| j) Upper/lower flammability or explosive limits: | <i>not true</i> |
| k) Vapour pressure: | practically not existing (25°C) |
| l) Vapour density: | unknown |
| m) Relative density: | 5,3 g/cm ³ (20 °C) |
| n) Solubility(ies): | practically insoluble in water (25°C) |
| o) Partition coefficient: n-octanol/water | unknown |
| p) Auto-ignition temperature: | <i>not true</i> |
| q) Decomposition temperature: | >400°C |
| r) Viscosity: | over 500°C plastically deformable |
| s) Explosive properties: | <i>not true</i> |
| t) Oxidising properties: | no |

9.2 Other information

Over 300°C becoming oxidized.

10. Stability and reactivity

| | |
|---|---|
| 10.1 Reactivity: | Reacts together with acids, strong bases and strong oxidizers. |
| 10.2 Chemical stability: | Stable when used and stored in accordance with this MSDS. |
| 10.3 Possibility of hazardous reactions: | Formation of gas in contact with inorganic acids. |
| 10.4 Conditions to avoid: | Acids, oxidizing substances, temperatures >700°C. |
| 10.5 Incompatible materials: | Strong inorganic acids, bases and oxidising substances. |
| 10.6 Hazardous decomposition products: | Formation of gaseous, very toxic dihydrogen selenide (H ₂ Se), and selenium dioxide (SeO ₂). |

11. Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008 Appendix I Chap.3*

(1) Acute toxicity

| | |
|------------------------|---|
| i. oral: | Category 3 |
| ii. dermal: | <i>no data available</i> |
| iii. inhalation | Category 3 / Threshold for toxic effects: 44,5mg/m ³ inhalativ for rats. |



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| | | |
|---|---|--|
| (2) Skin corrosion/irritation | <i>no data available</i> / Dermatitis for prolonged contact. | |
| (3) Serious eye damage/irritation | <i>no data available</i> / mechanical irritation | |
| (4) Sensitisation | <i>no data available</i> / tickly throat, flow cold | |
| i. respiratory: | <i>no data available</i> | |
| ii. skin: | <i>no data available</i> | |
| (5) Germ cell mutagenicity | <i>no data available</i> / Substance specific values not available. For several selenium substances genotoxic potential proofed for high doses. | |
| (6) Carcinogenicity | <i>no data available</i> / Suspicion due to experiments with animals and high doses of selenium sulphide and sodium selenate. | |
| (7) Reproductive toxicity | <i>no data available</i> / Substance specific values not available. Consequences not probable when keeping the limit values. | |
| Summary of evaluation of the CMR properties | Only a very low hazard potential for low dosages. | |
| (8) STOT-single exposure | <i>no data available</i> | target organ: |
| (9) STOT-repeated exposure | Category 2 | target organ: Liver, lung, and kidney, central nerve system |
| (10) Aspiration hazard | <i>no data available</i> / Danger of oedema of the lung. | |

11.2 Information on other danger*

11.2.1 Endocrine disrupting properties*

unknown

11.2.2 Other information*

none

12. Ecological information

12.1 Toxicity

| AQUATIC | Acute (short term) | Chronic (long term) ¹⁾ |
|--|---------------------------|-----------------------------------|
| Fresh water fish | <i>n.d.</i> ²⁾ | <i>n.d.</i> |
| Crustacea | <i>n.d.</i> | <i>n.d.</i> |
| Algae | <i>n.d.</i> | <i>n.d.</i> |
| Bacteria | <i>n.d.</i> | <i>n.d.</i> |
| Comments | | |
| ¹⁾ Study over 1-2 years ²⁾ no data available | | |

12.2 Persistence and degradability

Abiotic degradation:

unknown

Biotic degradation:

unknown

12.3 Bioaccumulation potential

Partition coefficient n-octanol/water (log Kow):

unknown

Bioconcentration factor (BCF):

unknown



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12.4 Mobility in soil

unknown

12.5 Results of PBT and vPvB assessment

Of no concern for this substance.

12.6 Endocrine disrupting properties*

unknown

12.7 Other adverse effects

unknown

12.8 Additional information

none

13. Disposal considerations

13.1 Waste treatment methods

- *Precaution code according to REACH:* P501 *Dispose of contents/container in accordance with local/regional/national/international regulation.*
- *Substance disposal:* Keep in original container without mixing with other waste material. Follow local resp. national safety regulations and rules for disposal of dangerous substances.
- *Packaging disposal:* Contaminated packaging should be handled like the substance. Decontaminated container can be put in the refuse.
- *Waste code according to LoW:* 16 03 03 *inorganic wastes containing dangerous substances*
15 01 10 *packaging containing residues of or contaminated by dangerous substances*
- *Other disposal recommendations:* Residues should not be disposed of over drainage.

14. Transport information

14.1 **UN number:** 3283

14.2 **UN proper shipping name:** SELENIUM COMPOUNDS, SOLID, N.O.S. (Zinc selenide)

14.3 **Transport hazard class(es):** 6.1 (Poisonous substance)

14.4 **Packing group:** II (Medium danger)

14.5 **Environmental hazards:** Marine pollutant.

14.6 **Special precautions for user:** *none*

14.7 **Transport in bulk according to IMO instruments:** Product is not transported in bulk. *

15. Regulatory information

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

EU Regulations

REACH Regulation 1907/2006, Art.57: *no substance of very high concern, not listed in SVHC register*



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| | |
|--|--|
| SEVESO3 Directive 2012/18/EC: | Appendix I, tabl.1, par. H2 Acute toxic cat.2-3 col.2/3 → 50/200t Appendix I, tabl.1, par. E1 Hazardous to the aquatic environment col.2/3 → 100/200t |
| RoHS Directive 2011/65/EC: Limitations of employment: | not listed in the substance list pay attention to <i>protection of young people at work</i> (Directive 94/33/EC) pay attention to <i>safety and health at work of pregnant workers</i> (Directive 92/85/EEC) |

National Regulations

GERMANY

| | |
|--|--|
| Wassergefährdungsklasse WGK: | WGK 3 ⇒ very dangerous for water |
| Technische Anleitung Luft (TA-Luft): Störfallverordnung (12.BImSchV): | all dust inorganic substances, class II: max. 2,5g Se/h or 0,5mg Se/m3 cf. SEVESO3 EC Directive |

| | |
|----------------------------|---|
| Limitations of employment: | Directive 94/33/EC for protection of young people at work, and Directive 92/85/EEC for safety and health at work of pregnant workers |
|----------------------------|---|

| | |
|---|--|
| Education with dangerous substances at school: (DGUV-Regel_113_018+019): | ZnSe not listed, but handling of Se and SeO2 prohibited for pupils in the first 4 school years |
|---|--|

Does *not* host any components, which are equivalent to a per- and polyfluoralkyl substance (PFAS) by definiton.*

None-EC Regulations/Databases for chemicals

| Land | Vorschrift/Liste | Notiz |
|-------------|--|------------------------------------|
| Australia | Industrial Chemical (Notification and Assessment) Act, AICS list [#] | listed |
| China | Inventory of Existing Chemical Substances, IECSC list [#] | listed |
| Japan | Kashin-Hou Law, ENCS list (MITI Inventory) [#] | MITI-No: 1-573 |
| Canada | Canadian Environmental Protection Act, DSL/NDSL list [#] | NDSL |
| Korea | Toxic Chemical Control Law, KECI-Liste [#] | KE-35579 NIER: 97-1-134 |
| New Zealand | New Zealand Inventory of Chemicals, NZIoC-Liste <i>for hazardous substances</i> [#] | HSNO Approval Code HSR 00 67 96 |
| Philippines | The Toxic Substances and Hazardous and Nuclear Waste Control Act, PICCS list [#] | - |
| USA | Toxic Substances Control Act, TSCA list [#] | ID: 8147 RN: 1315-09-9 |

[#] online search and/or download of the lists possible

15.2 Chemical Safety Assessment

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

16. Other information

Indication of changes (cf. marking *)

Necessary revision according to Regulation (EU) 2020/878 concerning changes in appendix II of Regulation (EC) 1907/2006 REACH

- 2.3 Other hazards: *information concerning endocrine properties added*
- PNEC values: table increased
- 11.1 Information on hazard classes: new description
- 11.2.1 Endocrine disrupting properties: added
- 11.2.2 Other information: added
- 12.6 Endocrine disrupting properties: added



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- 12.7 Other adverse effects: added
- 12.8 Additional information: added
- 14.7 : new description
- Notice on PFAS: *added*

Abbreviations and acronyms

| | | | | | |
|------------------|---|------------------|---|-------|--|
| AGS | Ausschuß für GefahrStoffe | GESTIS | GefahrStoffInformationsSystem der Deutschen Gesetzlichen Unfallversicherung | PNEC | Predicted No-Effect Concentration |
| AGW | ArbeitsplatzGrenzwert | GHS | Globally Harmonised System of classification and labelling of chemicals | PVA | PolyVinylAlkohol |
| ASchG | ArbeitnehmerinnenSCHutzGesetz, Österreich | IBC | International code for the construction and equipment of ships carrying dangerous Chemicals in Bulk | REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals |
| AVV | AbfallVerzeichnis Verordnung | LC ₅₀ | Lethal Concentration for 50% of the test group | RoHS | Restriction of Hazardous Substances |
| BAT | Biologischer ArbeitsplatzToleranzwert | LD ₅₀ | Lethal Dose for 50% of the test group | SCOEL | Scientific Committee on Occupational Exposure Limits |
| BGW | Biologischer Grenzwert | LD _{Lo} | Lowest Lethal Dose | SVHC | Substances Of Very High Concern |
| CAS | Chemical Abstracts Services | (E)LoW | European List Of Wastes | TRGS | Technische Regeln für GefahrStoffe |
| CLP | regulation on Classification, Labelling and Packaging of substances | LOEC | Lowest Observed Effective Concentration | UN | United Nations |
| DFG | DeutscheForschungsGemeinschaft | MAK | MaximaleArbeitsplatzKonzentration | UVG | UnfallVersicherungGsgesetz, Schweiz |
| DNEL | Derived No-Effect Level | MARPOL | international convention for the prevention of MARine POLLution from ships | vPvB | Very Persistent and Very Bioaccumulative |
| ECHA | European Chemicals Agency | NOAEL | No-Observed Adverse Effect Level | ZNS | Zentrales Nervensystem |
| EC ₅₀ | mean Effective Concentration for 50% of the test group | NOEC | No-Observed Effect Concentration | | |
| GefStoffV | GEfahrSTOFFVerordnung, Deutschland | PBT | Persistent, Bioaccumulative and Toxic | | |

Literature reference and sources of data

- ECHA-20-H-25-EN: *Guidance on the compilation of safety data sheets*, Version 4.0, ed. ECHA, Helsinki 12/2020 (ISBN: 978-92-9481-787-7)
- Common explanation and abbreviations etc.
<http://www.wikipedia.de>
- GESTIS substance data base of the Deutschen Gesetzlichen Unfallversicherung DGU,
<http://www.dguv.de/ifa/stoffdatenbank>
- GESTIS data base international limit values for chemicals of the DGU,
<http://www.dguv.de/ifa/GESTIS/GESTIS-Internationale-Grenzwerte-für-chemische-Substanzen-limit-values-for-chemical-agents>
- GESTIS data base DNEL values of the DGU,
<http://www.dguv.de/ifa/dneldatenbank>
- Data base GEFAHRGUT of the Bundesanstalt für Materialforschung und -prüfung BAM,
<http://www.dgg.bam.de/de/produkte/>
- List of SVHC substances (Stand: 03/2024) acc. Annex XIV of Regulation (EC) Nr.1907/2006 Art.59 Abs.1 REACH,
<http://echa.europa.eu/candidate-list-table>
- Classification, labelling and listing of hazardous substances in the Regulation (EC) Nr.1272/2008 (CLP-GHS)
- List of RoHS substances acc. Regulation 2011/65/EC (RoHS 2)
- Information on poison centres international,
<http://www.giz-nord.de/cms/index.php/giftnotrufliste-lang.html>
- MAK and BAT values in the publication of the Schweizer Unfallversicherungsanstalt Suva: *Grenzwerte am Arbeitsplatz 2015*, ed. Suva - Bereich Arbeitsmedizin, 2015, <http://www.suva.ch/waswo>
- Workplace exposure limits Norway: Nr.704 Forskrift om tiltaksverdier og grenseverdier, 08/2016,
<http://www.arbeidstilsynet.no>
- Workplace exposure limits Great Britain: EH40/2005 Workplace Exposure Limits, 2.ed. 2011,
<http://www.hse.gov.uk>
- Workplace exposure limits Spain: Límites des exposición profesional para agentes químicos en España, 2016, <http://www.insht.es>

Material Safety Data Sheet

According to Regulation (EC) Nr.1907/2006 (REACH)

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- Workplace exposure limits France: ED984 Valeurs limites d'exposition professionnelle aux agents chimiques en France, 07/2012, <http://www.inrs.fr>

Relevant H-statements

| | |
|-----------|--|
| EUH032 | Contact with acids liberates very toxic gases. |
| H301 | Toxic if swallowed. |
| H331 | Toxic if inhaled. |
| H373 | May cause damage to organs through prolonged or repeated exposure. |
| H410 | Very toxic to aquatic life with long lasting effects. |
| P260 | Do not breathe dust/fume/vapours/gas/mist/sprays. |
| P264 | Wash hands and skin thoroughly after handling. |
| P270 | Do not eat, drink or smoke when using this product. |
| P273 | Avoid release to the environment. |
| P301+P310 | IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. |
| P304+P312 | IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell. |
| P501 | Dispose of contents/container in accordance with local/regional/national/international regulation. |

The information contained herein is based on the present state of our knowledge. It characterizes the product with the regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.
This MSDS has been compiled and is solely intended for this product.