



## ZnSe, crystalline

Version 2.2 / EN

Revision date:

09.01.2023

### 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](mailto: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  $H_2Se$  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 is listed as dangerous substance according Annex VI, Table 3.1 of the Regulation (EC) 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).\*

## 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 vomitizing, 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 dihydrogene 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, SeO<sub>2</sub>, H<sub>2</sub>Se (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.

*Further information:*

none

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### 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 <sup>3</sup>	ppm	mg/m <sup>3</sup>		
<b>European Union</b>		<i>n.a.</i> <sup>1)</sup>		<i>n.a.</i> <sup>1)</sup>	<i>n.a.</i> <sup>1)</sup>	RL2000/39/EG
<i>Austria</i>		0,1 <sup>1)</sup>		0,3 <sup>2)</sup>	<i>n.a.</i> <sup>2)</sup>	ASchG
<i>France</i>		<i>n.a.</i> <sup>1)</sup>		<i>n.a.</i> <sup>1)</sup>	<i>n.a.</i> <sup>1)</sup>	
<i>Germany (AGS)</i>		0,05 <sup>1)</sup>		0,05 <sup>1)</sup>	<i>n.a.</i> <sup>1)</sup>	GefStoffV
<i>Italy</i>		<i>n.a.</i> <sup>1)</sup>		<i>n.a.</i> <sup>1)</sup>	<i>n.a.</i> <sup>1)</sup>	
<i>Norway</i>		0,05 <sup>1)</sup>		<i>n.a.</i> <sup>2)</sup>	<i>n.a.</i> <sup>2)</sup>	
<i>Spain</i>		<i>n.a.</i> <sup>1)</sup>		<i>n.a.</i> <sup>1)</sup>	<i>n.a.</i> <sup>1)</sup>	
<i>United Kingdom</i>		0,1 <sup>1)</sup>		<i>n.a.</i> <sup>2)</sup>	<i>n.a.</i> <sup>2)</sup>	
<b>Comments</b>						
<b>European Union</b>	<sup>1)</sup> not available					
<i>Austria</i>	<sup>1)</sup> breathable aerosol GKV register (2011), <sup>2)</sup> not available					
<i>France</i>	<sup>1)</sup> not available					
<i>Germany (AGS)</i>	AGW value, <sup>1)</sup> breathable fraction, inorganic selenium compounds, TRGS900 V.2006, <sup>2)</sup> selenium in serum (GESTIS data base)					
<i>Italy</i>	<sup>1)</sup> not listed in GESTIS data base					
<i>Norway</i>	<sup>1)</sup> listed in <i>Forskrift om tiltaksverdier og grenseverdier (Nr.704), 08/2016</i> as Selen og uorg. selenforb. (beregnet som Se), <sup>2)</sup> not available					
<i>Spain</i>	<sup>1)</sup> not available					
<i>United Kingdom</i>	<sup>1)</sup> listed in <i>EH40/2005 Workplace exposure limits, 2.ed. 2011</i> as Selenium and compounds (as Se), <sup>2)</sup> not available					
	* „short term“ means 15 minutes, short term value = exceeding factor × AGW, if not otherwise quoted.					

## DNELs

SUBSTANCE: ZINC SELENIDE  
CAS NO: 1315-09-9

Route of exposure	Effects	Person	Limit value
Oral	Acute systemic	Workers	<i>n.d.</i> <sup>1)</sup>
		Costumers	<i>n.d.</i>
	Chronic systemic	Workers	<i>n.d.</i>
		Costumers	<i>n.d.</i>
Dermal	Acute systemic	Workers	<i>n.d.</i>
		Costumers	<i>n.d.</i>
	Chronic systemic	Workers	<i>n.d.</i>
		Costumers	<i>n.d.</i>
Inhalation	Chronic systemic	Workers	1,7 mg/m <sup>3</sup>
		Costumers	1,7 mg/m <sup>3</sup>

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### Comments

<sup>1)</sup> no data available

### PNECs

SUBSTANCE: ZINC SELENIDE

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Environmental protection target	Value	Safety factor	Comments
Fresh water	<i>n.d.</i> <sup>1)</sup>		<sup>1)</sup> no data available
Marine water	<i>n.d.</i>		
Microorganisms in sewage treatment	<i>n.d.</i>		
Soil	<i>n.d.</i>		
Other release ways	<i>n.d.</i>		

## 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:*

*Instruction measures:*

*Organisational measures:*

*Technical measures:*

Just keep the necessary quantity at the place of usage.

Avoid entering the canalization. Use collection containers.

Place the collection container at the place of usage.

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)  |

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l) Vapour density:	unknown
m) Relative density:	5,3 g/cm <sup>3</sup> (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

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

## 11. Toxicological information

### 11.1 Information on toxicological effects

○ <i>Acute toxicity:</i>	Threshold for toxic effects: 44,5mg/m <sup>3</sup> inhalativ for rats
○ <i>Skin corrosion/irritation:</i>	Dermatitis for prolonged contact.
○ <i>Serious eye damage/irritation:</i>	Mechanical irritation.
○ <i>Respiratory or skin sensitisation:</i>	Tickly throat, flow cold.
○ <i>Carcinogenicity:</i>	Suspicion due to experiments with animals and high doses of selenium sulphide and sodium selenate.
○ <i>Germ cell mutagenicity:</i>	Substance specific values not available. For several selenium substances genotoxic potential proofed for high doses.
○ <i>Reproductive toxicity:</i>	Substance specific values not available. Consequences not probable when keeping the limit values.
○ <i>Summary of CMR properties:</i>	Only a very low hazard potential for low dosages.
○ <i>STOT-single exposure:</i>	<i>no</i>
○ <i>STOT-repeated exposure:</i>	Liver, lung, and kidney, nerve system.
○ <i>Aspiration hazard:</i>	Danger of oedema of the lung.

## 12. Ecological information

### 12.1 Toxicity

AQUATIC	Acute (short term)	Chronic (long term) <sup>1)</sup>
Fresh water fish	<i>n.d.</i> <sup>2)</sup>	<i>n.d.</i>
Crustacea	<i>n.d.</i>	<i>n.d.</i>
Algae	<i>n.d.</i>	<i>n.d.</i>



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Bacteria	<i>n.d.</i>	<i>n.d.</i>
<b>Comments</b>		
<sup>1)</sup> Study over 1-2 years <sup>2)</sup> 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*

### 12.4 Mobility in soil

*unknown*

### 12.5 Results of PBT and vPvB assessment

Of no concern for this substance.

### 12.6 Other adverse effects

*unknown*

## 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 Annex II of MARPOL / IBC code:** *no data*





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### 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  
 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

SEVESO3 Directive 2012/18/EC: not listed in the substance list

RoHS Directive 2011/65/EC: pay attention to *protection of young people at work* (Directive 94/33/EC)  
 Limitations of employment: pay attention to *safety and health at work of pregnant workers* (Directive 92/85/EEC)

##### National Regulations

###### GERMANY

Wassergefährdungsklasse WGK: WGK 3 ⇒ very dangerous for water  
 Technische Anleitung Luft (TA-Luft): all dust inorganic substances, class II: max. 2,5g Se/h or 0,5mg Se/m<sup>3</sup>  
 Störfallverordnung (12.BImSchV): 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 SeO<sub>2</sub> prohibited for pupils in the first 4 school years

##### None-EC Regulations/Databases for chemicals

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

<sup>#</sup> 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.





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### 16. Other information

**Indication of changes (cf. marking \*)**

- 2.3 Other hazards: information concerning RoHS 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 <sub>50</sub>	Lethal Concentration for 50% of the test group	RoHS	Restriction of Hazardous Substances
BAT	Biologischer ArbeitsplatzToleranzwert	LD <sub>50</sub>	Lethal Dose for 50% of the test group	SCOEL	Scientific Committee on Occupational Exposure Limits
BGW	Biologischer GrenzWert	LD <sub>Lo</sub>	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 <sub>50</sub>	mean Effective Concentration for 50% of the test group	NOEC	No-Observed Effect Concentration		
GefStoffV	GEFahrSTOFFVverordnung, Deutschland	PBT	Persistent, Bioaccumulative and Toxic		

**Literature reference and sources of data**

- ECHA Guidance 15-G-07.1-EN: *Guidance on the compilation of safety data sheets*, Version 3.1, ed. ECHA, Helsinki 11/2015 (ISBN: 978-92-9247-514-7)
- 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: 12/2015) acc. Annex XIV of Regulation (EC) Nr.1907/2006 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>

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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.