

zinc Z1 SHG

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

1.1. Product identifier

Product name	: zinc Z1 SHG
Synonyms	: KATHODE EN ONGELEGEERD ZINK; SSHG; Z1; zinc; ZINC BATTERY GRADE;; ZINC CATHODES; ZINC ELECTROLIQUE; zinc, solid, in massive state; ZINK, SHG (Special High Grade)
Registration number REACH	: 01-2119467174-37-0000 (Nyrstar Belgium NV/SA) 01-2119467174-37-0035 (Nyrstar Budel BV) 01-2119467174-37-0045 (Nyrstar France SAS)
Product type REACH	: Substance/mono-constituent
CAS number	: 7440-66-6
EC number	: 231-175-3
Molecular mass	: 65.37 g/mol
Formula	: Zn

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

1.2.1 Relevant identified uses

- IU01: Zinc metal production RLE (GESZn 0)
 - IU03: Storage of ingots-slabs in warehouses (GESZn 1)
 - IU04: Production of chemicals (pyro) (GESZn 3)
 - IU07: Melting, alloying and casting (GESZn 1)
 - IU08: Cathodic protection - sacrificial anodes (GESZn 1)
 - IU09: Downstream use of zinc-based sacrificial anodes (GESZn 8)
 - IU10: Extraction of PM (Parkes process) (GESZn 5)
 - IU11: Zinc casting / granules, pellets, prills, ... (GESZn 1, GESZn 6)
 - IU12: Zinc sheet casting and rolling (GESZn 1, GESZn 6)
 - IU13: Wire and rods manufacturing (GESZn 1, GESZn 6)
 - IU14: Downstream use of Zn based wire for metal spraying (GESZn 8)
 - IU15: Component for soldering/brazing/welding products (GESZn 1, GESZn 6)
 - IU16: Downstream use of Zinc based brazing/soldering products (GESZn 8)
 - IU17: Strips and coins manufacturing (GESZn 1, GESZn 6)
 - IU18: Batteries ballots, cans manufacturing (GESZn 1, GESZn 6)
 - IU19: Zinc (pure or alloyed) powder manufacturing (GESZn 2)
 - IU20: Passivated zinc powder manufacturing (pure or alloyed) (GESZn 2)
 - IU30: Brass manufacturing (GESZn 1)
 - IU31: Use of brass casts for transformation into semi-products (GESZn 6)
 - IU32: Use of brass containing products (ESZn 8)
 - IU33: Die-casting alloys manufacturing (GESZn 1)
 - IU34: Use of die-casting ingots (GESZn 6)
 - IU35: Manufacturing of Zinc containing Al-alloys (GESZn 1)
 - IU36: Use of zinc containing Al alloys (GESZn 6)
 - IU37: General hot dip galvanizing (GESZn 5)
 - IU38: Continuous hot dip galvanizing (GESZn 5)
 - IU39: Electroplating (GESZn 5)
 - IU40: Electroplating (GESZn 5)
 - IU41: Production of "targets by (EB) PVD or other sputtering techniques (GESZn 5)
 - IU42: Use of galvanized goods Generic consumer/environment
- For more detailed information regarding the Identified Uses and the associated Exposure Scenarios: see attached annex

1.2.2 Uses advised against

No uses advised against

1.3. Details of the supplier of the safety data sheet

Supplier of the safety data sheet

Nyrstar Belgium N.V. on behalf of Nyrstar Sales & Marketing A.G.
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Manufacturer of the product

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1.4. Emergency telephone number

24h/24h (Telephone advice: English, French, German, Dutch) :

+32 14 58 45 45 (BIG)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Not classified as dangerous according to the criteria of Regulation (EC) No 1272/2008

2.2. Label elements

Not classified as dangerous according to the criteria of Regulation (EC) No 1272/2008

2.3. Other hazards

The melting down of moist metal leads to explosion risk

Heated product causes burns

SECTION 3: Composition/information on ingredients

3.1. Substances

Name REACH Registration No	CAS No EC No	Conc. (C)	Classification according to CLP	Note	Remark
zinc 01-2119467174-37	7440-66-6 231-175-3	>99.995		(2)	Mono-constituent
lead massive: [particle diameter ≥1mm] 01-2119513221-59	7439-92-1 231-100-4	<30 ppm	Repr. 1A; H360FD Lact. ; H362 STOT RE 1; H372	(1)(2)(4)(10)	Impurity

(1) For H-statements in full: see heading 16

(2) Substance with a Community workplace exposure limit

(4) Enumerated in candidate list of substances of very high concern (SVHC) for authorisation (Article 59 of Regulation (EC) No. 1907/2006)

(10) Subject to restrictions of Annex XVII of Regulation (EC) No. 1907/2006

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

General:

Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

After inhalation:

After inhalation of fume: Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

After skin contact:

In case of burns: Wash immediately with lots of water (15 minutes)/shower. Remove clothing while washing. Do not tear off solidified product from the skin. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.

After eye contact:

After contact with fume: Rinse immediately with plenty of water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Take victim to an ophthalmologist.

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After ingestion:

Not applicable.

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

4.2.1 Acute symptoms

After inhalation:

AFTER INHALATION OF DUST: Irritation of the nasal mucous membranes. Dry/sore throat. Coughing. AFTER INHALATION OF FUME: Feeling of weakness. Metal fume fever. Vomiting. Nausea.

After skin contact:

IF MELTING: Burns.

After eye contact:

IF MELTING: Burns.

After ingestion:

No data available.

4.2.2 Delayed symptoms

No data available.

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

Not applicable.

SECTION 5: Firefighting measures

5.1. Extinguishing media

5.1.1 Suitable extinguishing media:

Adapt extinguishing media to the environment for surrounding fires.

5.1.2 Unsuitable extinguishing media:

Not applicable.

5.2. Special hazards arising from the substance or mixture

On burning formation of metallic fumes (zinc oxide). In molten state: violent to explosive reaction with water (moisture).

5.3. Advice for firefighters

5.3.1 Instructions:

Dilute toxic gases with water spray. In case of metal bath fire: add metal blocks. When cooling/extinguishing: no water in the substance.

5.3.2 Special protective equipment for fire-fighters:

Gloves. Protective clothing. Heat/fire exposure: compressed air/oxygen apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

No naked flames.

6.1.1 Protective equipment for non-emergency personnel

See heading 8.2

6.1.2 Protective equipment for emergency responders

Gloves. Protective clothing.

Suitable protective clothing

See heading 8.2

6.2. Environmental precautions

No data available

6.3. Methods and material for containment and cleaning up

If melted: allow liquid to solidify before taking it up. Pick-up the material. Wash clothing and equipment after handling.

6.4. Reference to other sections

See heading 13.

SECTION 7: Handling and storage

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

7.1. Precautions for safe handling

Avoid raising dust. Keep away from naked flames/heat. Observe strict hygiene. On (re)melting down: dry and preheat installation before use. Add only dry material to the metal bath.

7.2. Conditions for safe storage, including any incompatibilities

7.2.1 Safe storage requirements:

Storage temperature: Temperature above dew point. Store in a dry area. Keep at temperature above dew point. Meet the legal requirements.

7.2.2 Keep away from:

Heat sources, (strong) acids.

7.2.3 Suitable packaging material:

No data available

7.2.4 Non suitable packaging material:

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No data available

7.3. Specific end use(s)

If applicable and available, exposure scenarios are attached in annex. See information supplied by the manufacturer.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 Occupational exposure

a) Occupational exposure limit values

If limit values are applicable and available these will be listed below.

Belgium

Zinc (oxyde de) (fraction alvéolaire)	Time-weighted average exposure limit 8 h	2 mg/m ³
	Short time value	10 mg/m ³

France

Disulfiram	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	2 mg/m ³
Zinc (oxyde de, fumées)	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	5 mg/m ³

USA (TLV-ACGIH)

Zinc oxide	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	2 mg/m ³ (R)
	Short time value (TLV - Adopted Value)	10 mg/m ³ (R)

(R): Respirable fraction

b) National biological limit values

If limit values are applicable and available these will be listed below.

8.1.2 Sampling methods

Product name	Test	Number
Zinc & Cpds (as Zn)	NIOSH	7030
Zinc (Elements on wipes)	NIOSH	9102
Zinc (Elements)	NIOSH	7300
Zinc (Elements, aqua regia ashing)	NIOSH	7301
Zinc (Elements, hot block/HCl/HNO3 digestion)	NIOSH	7303
Zinc (Zn)	NIOSH	8005
Zinc (Zn)	NIOSH	8310
Zinc Oxide	NIOSH	7030
Zinc Oxide	NIOSH	7502
Zinc Oxide	OSHA	ID 121
Zinc Oxide	OSHA	ID 143
Zinc	NIOSH	7030
Zinc	OSHA	1006
Zinc	OSHA	ID 105
Zinc	OSHA	ID 121
Zinc	OSHA	ID 125G

8.1.3 Applicable limit values when using the substance or mixture as intended

If limit values are applicable and available these will be listed below.

8.1.4 Threshold values

DNEL/DMEL - Workers

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Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects dermal	83 mg/kg bw/day	
	Long-term systemic effects inhalation	5 mg/m ³	

DNEL/DMEL - General population

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Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects oral	0.83 mg/kg bw/day	
	Long-term systemic effects dermal	83 mg/kg bw/day	
	Long-term systemic effects inhalation	2.5 mg/m ³	

PNEC

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Compartment	Value	Remark
Fresh water	20.6 µg/l	
Marine water	6.1 µg/l	
STP	100 µg/l	
Fresh water sediment	117.8 mg/kg sediment dw	
Marine water sediment	56.5 mg/kg sediment dw	
Soil	35.6 mg/kg soil dw	

8.1.5 Control banding

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If applicable and available it will be listed below.

8.2. Exposure controls

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

8.2.1 Appropriate engineering controls

Avoid raising dust. Keep away from naked flames/heat.

8.2.2 Individual protection measures, such as personal protective equipment

Observe strict hygiene. Do not eat, drink or smoke during work.

a) Respiratory protection:

Dust production: dust mask with filter type P2.

b) Hand protection:

Gloves, On heating: insulated gloves.

- materials (good resistance)

Leather.

c) Eye protection:

On (re)melting down: face shield.

d) Skin protection:

Protective clothing. On (re)melting down: heatproof clothing. Protective clothing against molten metal splash (EN-ISO 9185). Protective clothing for workers exposed to heat (EN-ISO 11612). Safety shoes type S3.

8.2.3 Environmental exposure controls:

See headings 6.2, 6.3 and 13

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical form	Solid Metal Physical state depending on the production process
Odour	Odourless
Odour threshold	Not applicable
Colour	Commercial substance: grey-white
Particle size	Not applicable
Explosion limits	Not applicable
Flammability	Non-flammable
Log Kow	Not applicable
Dynamic viscosity	Not applicable
Kinematic viscosity	Not applicable
Melting point	416 °C ; 1013 hPa
Boiling point	907 °C ; Not required: exemption according to REACH
Evaporation rate	Ether ; Not applicable
Relative vapour density	Not applicable
Vapour pressure	Data not required
Solubility	Water ; insoluble
Relative density	7.1 ; 20 °C
Decomposition temperature	Not applicable
Auto-ignition temperature	Not applicable
Flash point	Not applicable
Explosive properties	No chemical group associated with explosive properties
Oxidising properties	No chemical group associated with oxidising properties
pH	Not applicable

9.2. Other information

Absolute density	7140 kg/m ³
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SECTION 10: Stability and reactivity

10.1. Reactivity

Not applicable.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

In molten state: violent to explosive reaction with water (moisture). Oxidizes slowly in moist air.

10.4. Conditions to avoid

Precautionary measures

Avoid raising dust. Keep away from naked flames/heat.

10.5. Incompatible materials

(strong) acids.

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10.6. Hazardous decomposition products

Reacts with (some) acids: release of highly flammable gases/vapours (hydrogen). On burning formation of metallic fumes (zinc oxide).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

11.1.1 Test results

- Toxicokinetics: summary

Zinc compounds release, depending on their solubility, zinc cations which determine the biological activity of the respective zinc compounds. Sufficient data is available on the soluble zinc compounds zinc chloride and zinc sulphate and on the slightly soluble zinc compounds ZnO and ZnCO₃.

Zinc is an essential trace element which is regulated and maintained in the various tissues mainly by the gastrointestinal absorption and secretion during high and low dietary zinc intake and because of the limited exchange of zinc between tissues, a constant supply of zinc is required to sustain the physiological requirements. The zinc absorption process in the intestines includes both passive diffusion and a carrier-mediated process. The absorption can be influenced by several factors such as ligands in the diet and the zinc status. Persons with adequate nutritional levels absorb 20-30% and animals absorb 40-50%. Persons that are zinc deficient absorb more, while persons with excessive zinc intake absorb less.

For the soluble zinc compounds, the available information suggests an oral absorption value of 20%. This value can be considered as the lower bound range at adequate nutritional levels. The oral absorption of the slightly soluble zinc oxide has been shown to be 60% of that of the soluble zinc compounds. This corresponds to approximately 12-18%. No oral absorption information is available for the remaining slightly soluble and insoluble zinc compounds (i.e., ZnO, Zn(OH)₂, Zn₃(PO₄)₂, ZnCO₃, Zn, ZnS). However, considering that these substances have lower water solubility than ZnO, it can be conservatively assumed that the oral absorption of these compounds is ≤ 12%.

Animal data suggests that there is pulmonary absorption following inhalation exposure. Half-life values of 14 and 6.3 hours were reported for dissolution of zinc oxide. The absorption of inhaled zinc depends on the particle size and the deposition of these particles therefore data was provided on the particle size distribution of zinc aerosol from three different industry sectors. The particle size distribution data was evaluated by using a multiple path particle deposition (MPPDep) model. This model revealed that for zinc aerosols the largest part of the deposition is in the head region and much less in the tracheobronchial and pulmonary region. Although most of the material deposited in the head and tracheobronchial region is rapidly translocated to the gastrointestinal tract, a part will also be absorbed locally.

Based on data for local absorption of radionuclides in the different airway regions, it can be assumed that the local absorption of the soluble zinc compounds will be approximately 20% of the material deposited in the head region, 50% of the material deposited in the tracheobronchial region and 100% of the material deposited in the pulmonary region. For the slightly soluble and insoluble zinc compounds a negligible absorption can be assumed for materials deposited in the head and the tracheobronchial region. 100% of the deposited slightly or insoluble zinc compounds are assumed to be absorbed in the pulmonary tract. The deposited material will be cleared via the lung clearance mechanisms into the gastrointestinal tract where it will follow oral absorption kinetics. Therefore the inhalation absorption for the soluble zinc compounds is a maximum of 40% and for the slightly soluble and insoluble zinc compounds inhalation absorption is at a maximum of 20%. These values can be assumed as a reasonable worst case, because they are considered to cover existing differences between the different zinc industry sectors with respect to the type of exercise activities (and thus breathing rate) and particle size distribution. The available information from in vivo as well as the in vitro studies suggests the dermal absorption of zinc compounds through intact skin to be less than 2%. In vitro studies that estimated dermal absorption values only on the basis of the zinc levels in the receptor medium without taking into account the zinc present in the stratum corneum appear to underestimate absorption values derived from in vivo studies. Such zinc trapped in the skin layers may become systemically available at a later stage. Quantitative data to evaluate the relevance of this skin depot are however lacking. Given the efficient homeostatic mechanisms of mammals to maintain the total body zinc and the physiologically required levels of zinc in the various tissues to be constant, the anticipated slow release of zinc from the skin is not expected to disturb the homeostatic zinc balance of the body. Considering the available information on dermal absorption, the default for dermal absorption of all zinc compounds (solutions or suspensions) is 2%. Based on the physical appearance, for dust exposure to zinc and zinc compounds a 10-fold lower default value of 0.2% is a reasonable assumption.

Zinc appears to be distributed to all tissues and tissue fluids and it is a cofactor in over 200 enzyme systems. The excretion of zinc is primarily via faeces, but also via urine, saliva, hair loss, sweat and mothers-milk.

Acute toxicity

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Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral	LD50	Equivalent to OECD 401	> 2000 mg/kg bw		Rat	Experimental value	
Dermal	LD50	Equivalent to OECD 402	> 2000 mg/kg bw	24 weeks (daily, 5 days / week)	Rat	Read-across	
Inhalation	LC50	Equivalent to OECD 403	> 5.41 mg/l	4 weeks (daily, 5 days / week)	Rat	Experimental value	
Inhalation (ZnO, metallic fume)	LC50	Equivalent to OECD 403	> 5.7 mg/l	4 weeks (daily, 5 days / week)	Rat	Experimental value	

Conclusion

Toxicity is only applicable when components are released
Low acute toxicity by the dermal route
Low acute toxicity by the oral route
Low acute toxicity by the inhalation route

Corrosion/irritation

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Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark
Eye	Moderately irritating	Equivalent to OECD 405			Rabbit	Experimental value	
Eye	Not irritating	Equivalent to OECD 405			Rabbit	Experimental value	
Dermal	Not irritating	Equivalent to OECD 404			Rabbit	Weight of evidence	
Dermal (ZnO, metallic fume)	Not irritating	Equivalent to OECD 404			Guinea pig	Read-across	
Dermal	Not irritating	Human observation			Human	Read-across	
Dermal (ZnO, metallic fume)	Not irritating	Human observation			Human	Literature	
Inhalation (ZnO, metallic fume)	Not irritating					Literature	

Conclusion

Not classified as irritating to the skin
Not classified as irritating to the eyes

Respiratory or skin sensitisation

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Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Dermal	Negative	Equivalent to OECD 429			Mouse	Read-across	
Dermal (ZnO, metallic fume)	Negative	Guinea pig maximisation test			Guinea pig	Experimental value	
Dermal (ZnO, metallic fume)	Negative	Human observation			Human		
Inhalation	Negative					Inconclusive, insufficient data	

Conclusion

Not classified as sensitizing for inhalation
Not classified as sensitizing for skin

Specific target organ toxicity

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Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Value determination
Oral	NOAEL	Equivalent to OECD 408	13.3 mg/kg bw/day	Blood	No effect	90 weeks (daily, 5 days / week)	Rat (male / female)	Read-across
Oral	NOAEL	Human observation study	50 mg/kg bw/day		No effect		Human (male / female)	Weight of evidence
Inhalation (ZnO, metallic fume)	NOAEL	Equivalent to OECD 409	2.7 mg/m ³	Lungs	No effect	5 day(s)	Guinea pig	Experimental value
Inhalation (ZnO, metallic fume)		Human observation		General	No effect		Human	Literature study

Conclusion

Low sub-chronic toxicity by the dermal route
Low sub-chronic toxicity by the oral route
Low sub-chronic toxicity by inhalation route

Mutagenicity (in vitro)

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Result	Method	Test substrate	Effect	Value determination
Negative	OECD 471	Bacteria (<i>S.typhimurium</i>)		Read-across

Mutagenicity (in vivo)

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Result	Method	Exposure time	Test substrate	Organ	Value determination
Negative	Equivalent to OECD 474		Rat		Read-across

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

Conclusion

Not classified for mutagenic or genotoxic toxicity

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Carcinogenicity

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Route of exposure	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Oral		Other		51 weeks (daily, 5 days / week)	Rat	No neoplastic effects	General	Literature study
Oral		Human observation study		204 weeks (daily, 5 days / week)	Human	No neoplastic effects	General	Literature study

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

Conclusion

Not classified for carcinogenicity

Reproductive toxicity

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	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Developmental toxicity		Human observation			Human (female)	No effect		Experimental value
	NOAEL	Equivalent to OECD 416	200 mg/kg bw/day	1 days (gestation, daily) - 18 days (gestation, daily)	Rat (female)	No effect		Weight of evidence
Effects on fertility		Human observation			Human (female)	No adverse systemic effects		Experimental value
	NOAEL	Equivalent to OECD 406	200 mg/kg bw/day		Rat (male / female)	No effect		Weight of evidence

The chronic toxicity of the component(s) relates only to the substance in finely divided state and/or in molten state

Conclusion

Not classified for reprotoxic or developmental toxicity

Toxicity other effects

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No (test)data available

Chronic effects from short and long-term exposure

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No effects known.

SECTION 12: Ecological information

12.1. Toxicity

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	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50	ASTM	0.169 mg/l	96 h	Oncorhynchus mykiss	Static system	Fresh water	Read-across
	LC50	Other	0.330 mg/l - 0.780 mg/l	96 h	Pimephales promelas	Static system		Read-across
Acute toxicity crustacea	EC50	US EPA	0.413 mg/l	48 h	Ceriodaphnia dubia	Static system	Fresh water	Experimental value
	EC50	Equivalent to OECD 202	0.530 mg/l	48 h	Daphnia magna	Static system	Fresh water	Read-across
	EC50	Other	0.095 mg/l - 0.530 mg/l	48 h	Ceriodaphnia dubia	Static system	Fresh water	Read-across
	NOEC	Other	201 mg/kg sediment dw	35 day(s)	Gammarus pulex	Semi-static system	Fresh water	Read-across
Toxicity algae and other aquatic plants	IC50	OECD 201	0.136 mg/l	72 h	Pseudokirchneriella subcapitata	Static system	Fresh water	Experimental value
	EC10	Other	0.0077 mg/l	7 day(s)	Ceramium tenuicore	Static system	Salt water	Experimental value
	EC10	Other	0.6708 mg/l	10 day(s)	Algae	Flow-through system	Salt water	Read-across

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Acute toxicity other aquatic organisms	NOEC	ASTM	1135 mg/kg sediment dw	28 day(s)	Tubifex tubifex	Flow-through system	Fresh water	Read-across
	NOEC	Other	0.400 mg/l	10 week(s)	Dreissena polymorpha	Static system	Fresh water	Read-across
Long-term toxicity fish	NOEC	Other	0.440 mg/l	72 day(s)	Oncorhynchus mykiss	Flow-through system	Fresh water	Read-across
	NOEC	Other	0.530 mg/l	36 month(s)	Salvelinus fontinalis	Flow-through system	Fresh water	Read-across
	NOEC	Other	0.025 mg/l	27 day(s)	Clupea harengus	Semi-static system	Salt water	Read-across
Long-term toxicity aquatic crustacea	NOEC	Other	0.037 mg/l	3 week(s)	Daphnia magna	Semi-static system	Fresh water	Read-across
	NOEC	US EPA	0.0056 mg/l	24 day(s)	Invertebrata	Semi-static system	Salt water	Read-across
Toxicity aquatic micro-organisms	EC50	Equivalent to OECD 209	5.2 mg/l	3 h		Static system	Fresh water	Read-across

	Parameter	Method	Value	Duration	Species	Value determination
Toxicity soil macro-organisms	NOEC	Other	1634 mg/kg soil dw	42 day(s)	Lumbricus terrestris	Read-across
	EC10	OECD 220	35.7 mg/kg soil dw	42 day(s)	Enchytraeus albidus	Read-across
Toxicity soil micro-organisms	NOEC	Other	17 mg/kg soil dw	12 week(s)	Soil micro-organisms	Read-across
	EC10	Other	2623 mg/kg soil dw	6 week(s)	Soil micro-organisms	Read-across
Toxicity terrestrial plants	EC10	OECD 208	5855 mg/kg soil dw	21 day(s)	Triticum aestivum	Read-across
	NOEC	OECD 208	32 mg/kg soil dw	25 day(s)	Triticum pratense	Read-across
Toxicity birds	NOEC	Other	> 150 mg/kg bw	28 day(s)	Anas platyrhynchos	Experimental value

Conclusion

Very toxic to aquatic plants

Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008

12.2. Persistence and degradability

Biodegradability: not applicable

12.3. Bioaccumulative potential

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BCF fishes

Parameter	Method	Value	Duration	Species	Value determination
		Not applicable			

BCF other aquatic organisms

Parameter	Method	Value	Duration	Species	Value determination
		Not applicable			

Log Kow

Method	Remark	Value	Temperature	Value determination
	Not applicable			

Conclusion

Bioaccumulation: not applicable

12.4. Mobility in soil

12.5. Results of PBT and vPvB assessment

The criteria of PBT and vPvB as listed in Annex XIII of Regulation (EC) No 1907/2006 do not apply to inorganic substances.

12.6. Other adverse effects

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Fluorinated greenhouse gases (Regulation (EU) No 517/2014)

Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 517/2014)

Ozone-depleting potential (ODP)

Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009)

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SECTION 13: Disposal considerations

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

13.1. Waste treatment methods

13.1.1 Provisions relating to waste

European Union

Can be considered as non hazardous waste according to Directive 2008/98/EC, as amended by Regulation (EU) No 1357/2014 and Regulation (EU) No 2017/997.

Waste material code (Directive 2008/98/EC, Decision 2000/0532/EC).

17 04 04 (metals (including their alloys): Zinc). Depending on branch of industry and production process, also other waste codes may be applicable.

13.1.2 Disposal methods

Recycle/reuse. Remove waste in accordance with local and/or national regulations.

13.1.3 Packaging/Container

No data available

SECTION 14: Transport information

Road (ADR), Rail (RID), Inland waterways (ADN), Sea (IMDG/IMSBC), Air (ICAO-TI/IATA-DGR)

14.1. UN number

Transport	Not subject
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14.2. UN proper shipping name

14.3. Transport hazard class(es)

Hazard identification number	
Class	
Classification code	

14.4. Packing group

Packing group	
Labels	

14.5. Environmental hazards

Environmentally hazardous substance mark	no
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14.6. Special precautions for user

Special provisions	
Limited quantities	

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

Annex II of MARPOL 73/78	Not applicable
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SECTION 15: Regulatory information

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

European legislation:

VOC content Directive 2010/75/EU

VOC content	Remark
	Not applicable (inorganic)

REACH Candidate list

Contains component(s) included in candidate list of substances of very high concern (SVHC) for authorisation (Article 59 of Regulation (EC) No 1907/2006)

REACH Annex XVII - Restriction

Contains component(s) subject to restrictions of Annex XVII of Regulation (EC) No 1907/2006: restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.

National legislation Belgium

No data available

National legislation The Netherlands

Waterbezwaarlijkheid	B (5); Algemene Beoordelingsmethodiek (ABM)
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National legislation France

No data available

National legislation Germany

WGK	nwg; Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (AwSV) - 18. April 2017
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National legislation United Kingdom

No data available

Other relevant data

No data available

15.2. Chemical safety assessment

Reason for revision: 3.1

Publication date: 2010-03-05

Date of revision: 2019-02-22

Revision number: 0106

Product number: 48875

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A chemical safety assessment has been performed.

SECTION 16: Other information

Full text of any H-statements referred to under heading 3:

H360FD May damage fertility. May damage the unborn child.

H362 May cause harm to breast-fed children.

H372 Causes damage to organs (blood, central nervous system, kidneys) through prolonged or repeated exposure.

(*)	INTERNAL CLASSIFICATION BY BIG
ADI	Acceptable daily intake
AOEL	Acceptable operator exposure level
CLP (EU-GHS)	Classification, labelling and packaging (Globally Harmonised System in Europe)
DMEL	Derived Minimal Effect Level
DNEL	Derived No Effect Level
EC50	Effect Concentration 50 %
ErC50	EC50 in terms of reduction of growth rate
LC50	Lethal Concentration 50 %
LD50	Lethal Dose 50 %
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent, Bioaccumulative & Toxic
PNEC	Predicted No Effect Concentration
STP	Sludge Treatment Process
vPvB	very Persistent & very Bioaccumulative

The information in this safety data sheet is based on data and samples provided to BIG. The sheet was written to the best of our ability and according to the state of knowledge at that time. The safety data sheet only constitutes a guideline for the safe handling, use, consumption, storage, transport and disposal of the substances/preparations/mixtures mentioned under point 1. New safety data sheets are written from time to time. Only the most recent versions may be used. Unless indicated otherwise word for word on the safety data sheet, the information does not apply to substances/preparations/mixtures in purer form, mixed with other substances or in processes. The safety data sheet offers no quality specification for the substances/preparations/mixtures in question. Compliance with the instructions in this safety data sheet does not release the user from the obligation to take all measures dictated by common sense, regulations and recommendations or which are necessary and/or useful based on the real applicable circumstances. BIG does not guarantee the accuracy or exhaustiveness of the information provided and cannot be held liable for any changes by third parties. This safety data sheet is only to be used within the European Union, Switzerland, Iceland, Norway and Liechtenstein. Any use outside of this area is at your own risk. Use of this safety data sheet is subject to the licence and liability limiting conditions as stated in your BIG licence agreement or when this is failing the general conditions of BIG. All intellectual property rights to this sheet are the property of BIG and its distribution and reproduction are limited. Consult the mentioned agreement/conditions for details.

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