

Safety data sheet according to 1907/2006/EC, Article 31

Printing date 25.10.2023

Version number 40 (replaces version 39)

Revision: 25.10.2023

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

· **1.1 Product identifier**

· **Product name:** Vario Alkaline-Cyanide Reagent Solution

· **Catalog number:** 530620, 4530620, 530621, 530622, 424452

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

· **Application of the substance / the preparation:** Reagent for water analysis

· **1.3 Details of the supplier of the safety data sheet**

· **Supplier:**

Tintometer GmbH
Schleefstraße 8-12
44287 Dortmund
Made in Germany
www.lovibond.com

phone: +49 (0)231 94510-0
e-mail: sales@lovibond.com

The Tintometer Limited
Lovibond® House
Sun Rise Way
Amesbury
Wiltshire SP4 7GR
United Kingdom

phone : +44 1980 664800
e-mail: SDS@lovibond.uk

· **Informing department:**

e-mail: sds@lovibond.com
Product Safety Department

· **1.4 Emergency telephone number:**

+44 1235 239670
Languages: English

SECTION 2: Hazards identification

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

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



GHS06 skull and crossbones

Acute Tox. 3 H301 Toxic if swallowed.
Acute Tox. 2 H310 Fatal in contact with skin.
Acute Tox. 3 H331 Toxic if inhaled.



GHS05 corrosion

Met. Corr. 1 H290 May be corrosive to metals.
Skin Corr. 1B H314 Causes severe skin burns and eye damage.
Eye Dam. 1 H318 Causes serious eye damage.



GHS09 environment

Aquatic Acute 1 H400 Very toxic to aquatic life.
Aquatic Chronic 1 H410 Very toxic to aquatic life with long lasting effects.

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2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008

The product is classified and labelled according to the GB CLP regulation.

Hazard pictograms



GHS05 GHS06 GHS09

Signal word Danger

Hazard-determining components of labelling:

sodium cyanide

sodium hydroxide

Hazard statements

H290 May be corrosive to metals.

H301+H331 Toxic if swallowed or if inhaled.

H310 Fatal in contact with skin.

H314 Causes severe skin burns and eye damage.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

P260 Do not breathe mist/vapours/spray.

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

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

P308+P310 IF exposed or concerned: Immediately call a POISON CENTER/doctor.

P405 Store locked up.

Additional information:

EUH032 Contact with acids liberates very toxic gas.

2.3 Other hazards Contact with skin and inhalation of aerosols/ vapours of the preparation should be avoided.

Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB), according to the criteria given in Annex XIII of Regulation (EC) No. 1907/2006.

Determination of endocrine-disrupting properties

The product does not contain substances with endocrine disrupting properties.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Description: aqueous solution

Dangerous components:

CAS: 143-33-9 EINECS: 205-599-4 Index No: 006-007-00-5	sodium cyanide ☠ Acute Tox. 2, H300; Acute Tox. 1, H310; Acute Tox. 2, H330; ☠ Met. Corr.1, H290; ☠ Aquatic Acute 1, H400 (M=10); Aquatic Chronic 1, H410 (M=10), EUH032	5–10%
CAS: 1310-73-2 EINECS: 215-185-5 Index No: 011-002-00-6 Reg.nr.: 01-2119457892-27-XXXX	sodium hydroxide ☠ Met. Corr.1, H290; Skin Corr. 1A, H314 Specific concentration limits: Skin Corr. 1A; H314: C ≥ 5 % Skin Corr. 1B; H314: 2 % ≤ C < 5 % Skin Irrit. 2; H315: 0.5 % ≤ C < 2 % Eye Irrit. 2; H319: 0.5 % ≤ C < 2 %	2.5–<5%

Additional information For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General information

Personal protection for the First Aider!

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Provide oxygen treatment if affected person has difficulty breathing.
Instantly remove any clothing soiled by the product.
Keep warm, position comfortably and cover well.
Remove breathing apparatus only after soiled clothing has been completely removed.

- **After inhalation**

Supply fresh air or oxygen.
In case of unconsciousness bring patient into stable side position for transport.
Call a doctor immediately.

- **After skin contact**

Instantly rinse with water.
Call a doctor immediately.

- **After eye contact**

Rinse opened eye for several minutes (at least 15 min) under running water.
Call a doctor immediately.

- **After swallowing**

Rinse out mouth and then drink 1-2 glasses of water.
Call a doctor immediately.

- **4.2 Most important symptoms and effects, both acute and delayed:**

burns
absorption
after absorption:
breathing difficulty
unconsciousness
headache
drowsiness
vomiting
coma
CNS disorders
cardiovascular disorders
cramps

- **Danger**

blockade of cellular respiration
Danger of disturbed cardiac rhythm.
Danger of gastric perforation.

- **4.3 Indication of any immediate medical attention and special treatment needed:**

If blue colouring appears (lips, ear-lobes, finger-nails), oxygen respiration treatment as quickly as possible.
antidotes: sodium thiosulfate, dimethylaminophenol

SECTION 5: Firefighting measures

- **5.1 Extinguishing media**

· **Suitable extinguishing agents** Use fire fighting measures that suit the environment.

- **5.2 Special hazards arising from the substance or mixture**

The product is not combustible.
Formation of toxic gases is possible during heating or in case of fire.
Hydrogen cyanide (HCN)
cyanide compounds, sodium monoxide

- **5.3 Advice for firefighters**

- **Protective equipment:**

Wear self-contained breathing apparatus.
Wear full protective suit.

- **Additional information**

Collect contaminated fire fighting water separately. It must not enter drains.
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.
Ambient fire may liberate hazardous vapours.

SECTION 6: Accidental release measures

- **6.1 Personal precautions, protective equipment and emergency procedures**

- **Advice for non-emergency personnel:**

Wear protective equipment. Keep unprotected persons away.
Avoid substance contact.
Ensure adequate ventilation

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Use breathing protection against the effects of fumes/dust/aerosol.

Advice for emergency responders:

Put on breathing apparatus.

Protective equipment: see section 8

6.2 Environmental precautions:

Do not allow product to reach sewage system or water bodies.

Inform respective authorities in case product reaches water or sewage system.

6.3 Methods and material for containment and cleaning up:

Ensure adequate ventilation.

Absorb with liquid-binding material (sand, diatomite, universal binders).

Dispose of contaminated material as waste according to item 13.

6.4 Reference to other sections

See Section 8 for information on personal protection equipment.

See Section 13 for information on disposal.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Advice on safe handling:

Open and handle container with care.

Work only in fume cupboard.

Prevent formation of aerosols.

Hygiene measures:

Do not inhale gases / fumes / aerosols.

Do not get in eyes, on skin, or on clothing.

Take off immediately all contaminated clothing.

Store protective clothing separately.

Wash hands during breaks and at the end of the work.

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

7.2 Conditions for safe storage, including any incompatibilities
Requirements to be met by storerooms and containers:

Store in cool location.

Store only in the original container.

Unsuitable material for container: metals, metal alloys

Unsuitable material for container: aluminium.

Information about storage in one common storage facility:

Store away from metals.

Do not store together with acids.

Further information about storage conditions:

Store in a locked cabinet or with access restricted to technical experts or their assistants.

Protect from heat and direct sunlight.

Protect from the effects of light.

Protect from humidity and keep away from water.

Recommended storage temperature: 20°C +/- 3°C
7.3 Specific end use(s) No further relevant information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Components with limit values that require monitoring at the workplace:
CAS: 143-33-9 sodium cyanide

WEL (Great Britain)	Short-term value: 5 mg/m ³ Long-term value: 1 mg/m ³ Sk, as CN
IOELV (European Union)	Short-term value: 5 mg/m ³ Long-term value: 1 mg/m ³ Skin; as cyanide

CAS: 1310-73-2 sodium hydroxide

WEL (Great Britain)	Short-term value: 2 mg/m ³
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Regulatory information

WEL (Great Britain): EH40/2020
IOELV (European Union): (EU) 2019/1831

DNELs

Derived No Effect Level (DNEL)

CAS: 1310-73-2 sodium hydroxide

Inhalative	DNEL	1 mg/m ³ (Worker / long-term / local effects)
		1 mg/m ³ (Consumer / long-term / local effects)

Recommended monitoring procedures:

Methods for measurement of the workplace atmosphere have to correspond to the requirements of norms DIN EN 482 and DIN EN 689.

Additional information: The lists that were valid during the compilation were used as basis.

8.2 Exposure controls
Engineering measures:

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment. See item 7.

Individual protection measures, such as personal protective equipment

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled.

Eye/face protection Tightly sealed safety glasses.

Hand protection

Alkaline resistant gloves

Preventive skin protection by use of skin-protecting agents is recommended.

After use of gloves apply skin-cleaning agents and skin cosmetics.

Material of gloves

nitrile rubber, NBR

Recommended thickness of the material: ≥ 0.35 mm
Penetration time of glove material

Value for the permeation: Level = 1 (< 10 min)

The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

Other skin protection (body protection): Alkaline resistant protective clothing

Breathing equipment:

Use breathing protection against the effects of fumes/dust/aerosol.

In case of brief exposure or low pollution use breathing filter apparatus. In case of intensive or longer exposure use breathing apparatus that is independent of circulating air.

Recommended filter device for short term use: Combination filter B-P3

Environmental exposure controls

Avoid release to the environment.

Do not allow product to reach sewage system or water bodies.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Fluid
Form:	Solution
Colour:	Colourless
Odour:	Odourless
Odour threshold:	Not applicable.
Melting point/Freezing point:	Not determined.
Boiling point or initial boiling point and boiling range	Not determined.
Flammability	The product is not combustible.
Explosive properties:	Product is not explosive.
Lower and upper explosion limit	
Lower:	Not applicable.
Upper:	Not applicable.
Flash point:	Not applicable.
Auto-ignition temperature:	Not applicable.
Decomposition temperature:	Not determined.
pH at 20°C	13.7

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· Kinematic viscosity	Not determined.
· Solubility	
· Water:	Fully miscible
· Partition coefficient n-octanol/water (log value)	Not applicable (mixture).
· Vapour pressure:	Not determined.
· Density and/or relative density	
· Density at 20°C:	1.04 g/cm ³
· Relative density:	Not determined.
· Relative gas density	Not determined.
· Particle characteristics	Not applicable (liquid).
· 9.2 Other information	
· Information with regard to physical hazard classes	
· Corrosive to metals	May be corrosive to metals.
· Metals that are corroded by the substance or mixture	Information on incompatible materials can be found in Sections 7 and 10.
· Other safety characteristics	
· Oxidising properties:	none
· Additional information	
· Solids content:	< 10 %
· Solvent content:	
· Organic solvents:	0 %
· Water:	> 90 %

SECTION 10: Stability and reactivity

- **10.1 Reactivity** see section 10.3
- **10.2 Chemical stability** Stable at ambient temperature (room temperature).
- **10.3 Possibility of hazardous reactions**
 Reacts with metals forming hydrogen (Danger of explosion in case of large amounts!)
 Corrosive action on metals
 Exothermic reaction with acids
 Corrodes aluminium
 Reacts with acids releasing Hydrogen cyanide (prussic acid).
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials:**
 metals
 light metals
 aluminium
 zinc
 organic substances
- **10.6 Hazardous decomposition products:**
 hydrogen cyanide (prussic acid HCN)
 In case of fire: see section 5.

SECTION 11: Toxicological information

- **11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**
- **Acute toxicity**
 Classification according to calculation procedure:
 Toxic if swallowed or if inhaled.
 Fatal in contact with skin.

· Acute toxicity estimate (ATE_(MIX)) - Calculation method:		
Oral	CLP ATE _(MIX)	92 mg/kg (.)
Dermal	CLP ATE _(MIX)	133 mg/kg (.)
Inhalative	CLP ATE _(MIX)	0.9 mg/l/4h (aerosol (dust, mist))

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· LD/LC50 values that are relevant for classification:		
CAS: 143-33-9 sodium cyanide		
Oral	LD50	5.09 mg/kg (rat) (Registrant, ECHA)
	LD ₅₀	2.8 mg/kg (human)
	LDLo	500 mg/kg (rabbit)
Dermal	LD50	7.35 mg/kg (rabbit) (Registrant, ECHA)
Inhalative	LC50/4h	0.05 mg/l (ATE)
CAS: 1310-73-2 sodium hydroxide		
Oral	LDLo	500 mg/kg (rabbit) (IUCLID)

- **Skin corrosion/irritation** Causes severe skin burns and eye damage.
- **Serious eye damage/irritation**
Causes serious eye damage.
Risk of blindness!
- **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.

· Information on components:		
CAS: 1310-73-2 sodium hydroxide		
Sensitisation	Patch test (human)	(negative)

- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity** Based on available data, the classification criteria are not met.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT (specific target organ toxicity) -single exposure** Based on available data, the classification criteria are not met.
- **STOT (specific target organ toxicity) -repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.

· Information on likely routes of exposure

In the workplace, sodium hydroxide can be inhaled in the form of dusts or as a liquid aerosol. Due to the pronounced irritant effect (warning effect), prolonged massive exposures are generally avoided. In case of accidental ingestion of dust or swallowing of solution, rapid penetration of the alkali or Na and OH ions into the contacted tissues and partial transfer into the blood is to be expected.

Even if NaOH comes into contact with the skin as a solid, it will act as a concentrated solution due to its hygroscopicity through rapid water absorption.

The most frequent causes of accidents in occupational handling are accidental direct contact with eyes and skin.

· Additional toxicological information:

The following applies to cyanogen compounds/nitriles in general: Extreme caution! Hydrogen cyanide release possible - Blockage of cell respiration. Cardiovascular disorders, shortness of breath, unconsciousness.

CAS 143-33-9: Danger by skin resorption.

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

CAS: 1310-73-2 sodium hydroxide	
·	(source: GESTIS) Main toxic effects: Acute: strong irritation and caustic effect on all contacted mucous membranes and the skin, risk of irreversible eye damage (risk of blindness) Chronic: Irritant effect on eyes, respiratory tract and skin
	Further information: Irrespective of the route of exposure, the focus is on the local effect, which is characterized by swelling and dissolution of the contacted tissue (colliquation necrosis) that progresses rapidly in depth. The extent of the tissue damage essentially depends on the duration of exposure, concentration, pH value, dose and onset of treatment measures.

- **11.2 Information on other hazards**
- **Endocrine disrupting properties** The product does not contain substances with endocrine disrupting properties.
- **Other information**
This substance / mixture should be handled with particular care.

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According to the information available to us, the chemical, physical and toxicological properties of the substances mentioned in Chapter 3 have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity
Aquatic toxicity:
CAS: 143-33-9 sodium cyanide

NOEC	0.011 mg/l/96h (fish)
LC50	0.083 mg/l/96h (bluegill) (IUCLID)
	0.057 mg/l/96h (rainbow trout) (IUCLID)
	0.12 mg/l/96h (fathead minnow)

CAS: 1310-73-2 sodium hydroxide

LC50	40.4 mg/l/48h (Ceriodaphnia sp.) (ECHA)
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Bacterial toxicity:
CAS: 1310-73-2 sodium hydroxide

EC50	22 mg/l (Photobacterium phosphoreum) (15 min)
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12.2 Persistence and degradability
Other information:

Mixture of inorganic compounds.
Methods for the determination of biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Pow = n-octanol/wasser partition coefficient
log Pow < 1 = Does not accumulate in organisms.

CAS: 143-33-9 sodium cyanide

log Pow	0.44 (.)
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12.4 Mobility in soil No further relevant information available.

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB), according to the criteria given in Annex XIII of Regulation (EC) No. 1907/2006.

12.6 Endocrine disrupting properties The product does not contain substances with endocrine disrupting properties.

12.7 Other adverse effects

Forms corrosive mixtures with water even if diluted.
Harmful effect due to pH shift.
Reacts with water to form toxic decomposition products.
Avoid transfer into the environment.

Water hazard:

Do not allow product to reach ground water, water bodies or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into soil.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Recommendation

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
Hand over to disposers of hazardous waste.

European waste catalogue

16 05 07*	discarded inorganic chemicals consisting of or containing hazardous substances
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Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

Recommended cleaning agent: Water, if necessary with cleaning agent.

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SECTION 14: Transport information

<ul style="list-style-type: none"> · 14.1 UN number or ID number · ADR, IMDG, IATA 	UN2922
<ul style="list-style-type: none"> · 14.2 UN proper shipping name · ADR · IMDG · IATA 	2922 CORROSIVE LIQUID, TOXIC, N.O.S. (SODIUM HYDROXIDE, SODIUM CYANIDE), ENVIRONMENTALLY HAZARDOUS CORROSIVE LIQUID, TOXIC, N.O.S. (SODIUM HYDROXIDE, SODIUM CYANIDE), MARINE POLLUTANT CORROSIVE LIQUID, TOXIC, N.O.S. (SODIUM HYDROXIDE, SODIUM CYANIDE)
<ul style="list-style-type: none"> · 14.3 Transport hazard class(es) · ADR 	<div style="display: flex; justify-content: space-around; align-items: center;">    </div>
<ul style="list-style-type: none"> · Class · Label 	8 (CT1) Corrosive substances. 8+6.1
<ul style="list-style-type: none"> · IMDG 	<div style="display: flex; justify-content: space-around; align-items: center;">    </div>
<ul style="list-style-type: none"> · Class · Label 	8 Corrosive substances. 8/6.1
<ul style="list-style-type: none"> · IATA 	<div style="display: flex; justify-content: space-around; align-items: center;">   </div>
<ul style="list-style-type: none"> · Class · Label 	8 Corrosive substances. 8 (6.1)
<ul style="list-style-type: none"> · 14.4 Packing group · ADR, IMDG, IATA 	II
<ul style="list-style-type: none"> · 14.5 Environmental hazards: · Marine pollutant: · Special marking (ADR): 	Product contains environmentally hazardous substances: sodium cyanide Yes Symbol (fish and tree) Symbol (fish and tree)
<ul style="list-style-type: none"> · 14.6 Special precautions for user · Kemler Number: · EMS Number: · Segregation groups · Stowage Category · Stowage Code 	Warning: Corrosive substances. 86 F-A,S-B (SGG18) Alkalis, (SGG6) cyanides B SW2 Clear of living quarters.
<ul style="list-style-type: none"> · 14.7 Maritime transport in bulk according to IMO instruments 	Not applicable.
<ul style="list-style-type: none"> · Transport/Additional information: · ADR · Excepted quantities (EQ): · Limited quantities (LQ) · Excepted quantities (EQ) · Transport category · Tunnel restriction code 	E2 1L Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml 2 E

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· IMDG	
· Limited quantities (LQ)	1L
· Excepted quantities (EQ)	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml

* SECTION 15: Regulatory information

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

 · **Poisons Act UK**

 · **Regulated explosives precursors**

None of the ingredients is listed.

 · **Regulated poisons**

CAS: 143-33-9 sodium cyanide

Listed

 · **Reportable explosives precursors**

None of the ingredients is listed.

 · **Reportable poisons**

The concentration of the substance is less than the stated mass percentage and is therefore of no concern.

CAS: 1310-73-2 sodium hydroxide

12% of total caustic alkalinity

 · **Regulation (EU) 2019/1148 on the marketing and use of explosives precursors** not regulated

 · **Regulation (EU) No 649/2012 concerning the export and import of hazardous chemicals (PIC)**

None of the ingredients is listed.

 · **Regulation (EC) No 1334/2000 setting up a Community regime for the control of exports of dual-use items and technology:**

CAS: 143-33-9 sodium cyanide

 · **Regulation (EC) No 273/2004 on drug precursors**

None of the ingredients is listed.

 · **Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors**

None of the ingredients is listed.

 · **Regulation (EC) No 1005/2009 on substances that deplete the ozone layer:**

None of the ingredients is listed.

 · **REGULATION (EU) 2019/1021 on persistent organic pollutants (POP)**

None of the ingredients is listed.

 · **LIST OF SUBSTANCES SUBJECT TO AUTHORISATION (ANNEX XIV)**

None of the ingredients is listed.

 · **Substances of very high concern (SVHC) according to REACH, Article 57**
This product does not contain any substances of very high concern above the legal concentration limit of $\geq 0.1\%$ (w / w).

 · **Substances of very high concern (SVHC) according to UK REACH**
This product does not contain any substances of very high concern above the legal concentration limit of $\geq 0.1\%$ (w / w).

 · **Directive 2012/18/EU (SEVESO III):**

 · **Named dangerous substances - ANNEX I** None of the ingredients is listed.

 · **Seveso category**

H2 ACUTE TOXIC

E1 Hazardous to the Aquatic Environment

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

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

 · **REGULATION (EC) No 1907/2006 ANNEX XVII** Conditions of restriction: 3

 · **Information about limitation of use:**

Employment restrictions concerning young persons must be observed (94/33/EC).

Employment restrictions concerning pregnant and lactating women must be observed (92/85/EEC).

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- **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.
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SECTION 16: Other information

These data are based on our present knowledge. However, they shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

This Safety Data Sheet is in compliance with Regulation (EC) No 1907/2006, Article 31 as amended by Regulation (EU) 2020/878.

- **Training hints** Provide adequate information, instruction and training for operators.

- **Relevant phrases**

H290 May be corrosive to metals.
 H300 Fatal if swallowed.
 H310 Fatal in contact with skin.
 H314 Causes severe skin burns and eye damage.
 H330 Fatal if inhaled.
 H400 Very toxic to aquatic life.
 H410 Very toxic to aquatic life with long lasting effects.
 EUH032 Contact with acids liberates very toxic gas.

- **Abbreviations and acronyms:**

EC50: effective concentration, 50 percent (in vivo)
 OECD: Organisation for Economic Co-operation and Development
 STOT: specific target organ toxicity
 SE: single exposure
 RE: repeated exposure
 EC50: half maximal effective concentration
 IC50: half maximal inhibitory concentration
 NOEL or NOEC: No Observed Effect Level or Concentration
 ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)
 RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
 IMDG: International Maritime Code for Dangerous Goods
 IATA: International Air Transport Association
 GHS: Globally Harmonised System of Classification and Labelling of Chemicals
 EINECS: European Inventory of Existing Commercial Chemical Substances
 ELINCS: European List of Notified Chemical Substances
 CAS: Chemical Abstracts Service (division of the American Chemical Society)
 DNEL: Derived No-Effect Level (UK REACH)
 LC50: Lethal concentration, 50 percent
 LD50: Lethal dose, 50 percent
 PBT: Persistent, Bioaccumulative and Toxic
 SVHC: Substances of Very High Concern
 vPvB: very Persistent and very Bioaccumulative
 Met. Corr. 1: Corrosive to metals – Category 1
 Acute Tox. 2: Acute toxicity – Category 2
 Acute Tox. 3: Acute toxicity – Category 3
 Acute Tox. 1: Acute toxicity – Category 1
 Skin Corr. 1A: Skin corrosion/irritation – Category 1A
 Skin Corr. 1B: Skin corrosion/irritation – Category 1B
 Eye Dam. 1: Serious eye damage/eye irritation – Category 1
 Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1
 Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1

- **Sources**

Data arise from safety data sheets, reference works and literature.
 IUCLID (International Uniform Chemical Information Database)
 ECHA: European Chemicals Agency <http://echa.europa.eu>
 GESTIS- Stoffdatenbank (Substance Database, Germany)

- *** Data compared to the previous version altered.**
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