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

Printing date 19.04.2024 Version number 17 (replaces version 16) Revision: 15.11.2023

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

· **1.1 Product identifier**

· **Product name: Residual Hardness RH-1**

· **Catalog number:** 424342, 418554-1, 418514-1, 424342-0

· **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**


GHS08 health hazard

Repr. 1B H360FD May damage fertility. May damage the unborn child.


GHS05 corrosion

Met. Corr.1 H290 May be corrosive to metals.


GHS07

Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2 H319 Causes serious eye irritation.

· **2.2 Label elements**
· **Labelling according to Regulation (EC) No 1272/2008**
The product is classified and labelled according to the GB CLP regulation.

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**Product name: Residual Hardness RH-1**

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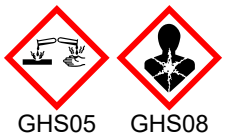
· **Hazard pictograms**



GHS05 GHS08

· **Signal word** Danger
· **Hazard-determining components of labelling:**
disodium tetraborate decahydrate
· **Hazard statements**
H290 May be corrosive to metals.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H360FD May damage fertility. May damage the unborn child.
· **Precautionary statements**
P280 Wear protective gloves/protective clothing/eye protection.
P201 Obtain special instructions before use.
P308+P313 IF exposed or concerned: Get medical advice/attention.
P405 Store locked up.
· **Additional information:**
Restricted to professional users.

· **2.3 Other hazards** No further relevant information available.

· **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: 1310-73-2<br>EINECS: 215-185-5<br>Index No: 011-002-00-6<br>Reg.nr.: 01-2119457892-27-XXXX | sodium hydroxide<br>Met. Corr.1, H290; Skin Corr. 1A, H314<br>Specific concentration limits: Skin Corr. 1A; H314: C ≥ 5 %<br>Skin Corr. 1B; H314: 2 % ≤ C < 5 %<br>Skin Irrit. 2; H315: 0.5 % ≤ C < 2 %<br>Eye Irrit. 2; H319: 0.5 % ≤ C < 2 % | 0.5–<2% |
| CAS: 1303-96-4<br>EINECS: 215-540-4<br>Index No: 005-011-00-4<br>Reg.nr.: 01-2119490790-32-XXXX | disodium tetraborate decahydrate<br>Repr. 1B, H360FD; Acute Tox. 4, H332; Eye Irrit. 2, H319 | 0.3–<1% |

· **SVHC**

| | |
|---|---|
| CAS: 1303-96-4 | disodium tetraborate decahydrate |

· **SVHC (UK)**

| | |
|---|---|
| CAS: 1303-96-4 | disodium tetraborate decahydrate |

· **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** Instantly remove any clothing soiled by the product.
· **After inhalation** Supply fresh air. Call a doctor.
· **After skin contact**
Instantly rinse with water.
Seek medical advice.
· **After eye contact** Rinse opened eye for several minutes (at least 15 min) under running water. Then consult doctor.

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· **After swallowing**
Rinse out mouth and then drink 1-2 glasses of water.
Seek medical treatment.
· **4.2 Most important symptoms and effects, both acute and delayed:**
irritations
absorption
after inhalation:
mucosal irritations, cough, shortness of breath
after swallowing:
gastric or intestinal trouble
sickness
vomiting
fatigue
after absorption of large amounts:
CNS disorders
cardiovascular disorders
cramps
· **4.3 Indication of any immediate medical attention and special treatment needed:** No further relevant information available.

## 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.
· **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
· **Advice for emergency responders:** Protective equipment: see section 8

· **6.2 Environmental precautions:** Do not allow product to reach sewage system or water bodies.
· **6.3 Methods and material for containment and cleaning up:**
Ensure adequate ventilation.
Use neutralising agent.
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:** No special precautions necessary if used correctly.
· **Hygiene measures:**
Do not get in eyes, on skin, or on clothing.
Take off immediately all contaminated clothing.
Store protective clothing separately.

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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.
Keep only in original packaging.
· **Information about storage in one common storage facility:** Store away from metals.
· **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 +/- 5°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: 1310-73-2 sodium hydroxide** | |
| WEL (Great Britain) | Short-term value: 2 mg/m³ |

· **Regulatory information** WEL (Great Britain): EH40/2020

· **DNELs**
Derived No Effect Level (DNEL)

| **CAS: 1310-73-2 sodium hydroxide** | | |
|---|---|---|
| Inhalative | DNEL | 1 mg/m³ (Worker / long-term / local effects)<br>1 mg/m³ (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:** No further data; see section 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**
Safety glasses
Use safety glasses that have been tested and approved in accordance with government standards such as EN 166.
· **Hand protection**
Protective 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: ≥ 0.11 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):** Protective work clothing.
· **Breathing equipment:** Use breathing protection against the effects of fumes/dust/aerosol.
· **Recommended filter device for short term use:** Filter P3

· **Environmental exposure controls** Do not allow product to reach sewage system or water bodies.



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## 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** | 100°C (CAS: 7732-18-5 water) |
| · **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** | 13.4 |
| · **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:** | 1.02 g/cm³ |
| · **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. |
| · **Metal corrosion rate:** | acc. to "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Fifth revised Edition" |
| · **Corrosion rate (aluminium)** | > 320 mm/a |
| · **Other safety characteristics** | |
| · **Oxidising properties:** | none |
| · **Additional information** | |
| · **Solids content:** | < 5 % |
| · **Solvent content:** | |
| · **Organic solvents:** | 0 % |
| · **Water:** | > 95 % |

## 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**
Corrosive action on metals
Corrodes aluminium
Exothermic reaction with acids
· **10.4 Conditions to avoid** No further relevant information available.
· **10.5 Incompatible materials:**
metals
light metals
aluminium
zinc
· **10.6 Hazardous decomposition products:** see section 5



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## SECTION 11: Toxicological information

· **11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**

· **Acute toxicity** Based on available data, the classification criteria are not met.

| · **LD/LC50 values that are relevant for classification:** | | |
|---|---|---|
| **CAS: 1310-73-2 sodium hydroxide** | | |
| Oral | LDLo | 500 mg/kg (rabbit)<br>(IUCLID) |
| **CAS: 1303-96-4 disodium tetraborate decahydrate** | | |
| Oral | LD50 | 2660 mg/kg (rat)<br>(RTECS) |
| | LDLo | 709 mg/kg (human) |
| Dermal | LD50. | >2000 mg/kg (rabbit)<br>(IUCLID) |

· **Skin corrosion/irritation** Causes skin irritation.
· **Serious eye damage/irritation** Causes serious eye irritation.
· **Information on components:**
CAS 1310-73-2: chronic: dermatitis

| **CAS: 1303-96-4 disodium tetraborate decahydrate** | | |
|---|---|---|
| Irritation of eyes | OECD 405 | (rabbit: irritation) |

· **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) |
| **CAS: 1303-96-4 disodium tetraborate decahydrate** | | |
| Sensitisation | Patch test (human) | (negative)<br>(IUCLID) |

· **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** May damage fertility. May damage the unborn child.

· **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.
Inhalation of dusts is the main route of exposure in the manufacture and commercial use of borax. Additional absorption through the skin cannot be ruled out, but only if this organ is previously damaged. [GESTIS]

| · **Additional toxicological information:** |
|---|
| **CAS: 1310-73-2 sodium hydroxide** |
| . (source: GESTIS)<br>Main toxic effects:<br>Acute: strong irritation and caustic effect on all contacted mucous membranes and the skin, risk of irreversible eye damage (risk of blindness)<br>Chronic: Irritant effect on eyes, respiratory tract and skin<br><br>Further information:<br>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.<br>The extent of the tissue damage essentially depends on the duration of exposure, concentration, pH value, dose and onset of treatment measures. |

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· **11.2 Information on other hazards**
· **Endocrine disrupting properties** The product does not contain substances with endocrine disrupting properties.

· **Other information**
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: 1310-73-2 sodium hydroxide** | |
| LC50 | 40.4 mg/l/48h (Ceriodaphnia sp.)<br>(ECHA) |
| **CAS: 1303-96-4 disodium tetraborate decahydrate** | |
| EC50 | 1085–1402 mg/l/48h (Daphnia magna)<br>(IUCLID) |
| IC50 | 158 mg/l/96 h (Desmodesmus subspicatus)<br>(IUCLID, anhydrous substance) |
| LC50 | 5600 mg/l/96h (mosquitofish)<br>($BH_3O_3$) |
| LC50 | 807 mg/l (fish)<br>(anhydrous substance) |

| · **Bacterial toxicity:** | |
|---|---|
| **CAS: 1310-73-2 sodium hydroxide** | |
| EC50 | 22 mg/l (Photobacterium phosphoreum) (15 min) |
| **CAS: 1303-96-4 disodium tetraborate decahydrate** | |
| EC5 | 1.3 mg/l (Entosiphon sulcatum) (72h)<br>(IUCLID) |

· **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** | |
|---|---|
| **CAS: 1303-96-4 disodium tetraborate decahydrate** | |
| log Pow | -1.53 (.) |

· **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.
Avoid transfer into the environment.
· **Remark:** neutralization possible

## 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.

## SECTION 14: Transport information

| | |
|---|---|
| · **14.1 UN number or ID number** | |
| · **ADR, IMDG, IATA** | UN1824 |
| · **14.2 UN proper shipping name** | |
| · **ADR** | 1824 SODIUM HYDROXIDE SOLUTION |
| · **IMDG, IATA** | SODIUM HYDROXIDE SOLUTION |
| · **14.3 Transport hazard class(es)** | |
| · **ADR** | |

| | |
|---|---|
| · **Class** | 8 (C5) Corrosive substances. |
| · **Label** | 8 |
| · **IMDG, IATA** | |

| | |
|---|---|
| · **Class** | 8 Corrosive substances. |
| · **Label** | 8 |
| · **14.4 Packing group** | |
| · **ADR, IMDG, IATA** | III |
| · **14.5 Environmental hazards:** | |
| · **Marine pollutant:** | No |
| · **14.6 Special precautions for user** | Warning: Corrosive substances. |
| · **Kemler Number:** | 80 |
| · **EMS Number:** | F-A,S-B |
| · **Segregation groups** | (SGG18) Alkalis |
| · **Stowage Category** | A |
| · **Segregation Code** | SG35 Stow "separated from" SGG1-acids |
| · **14.7 Maritime transport in bulk according to IMO instruments** | Not applicable. |
| · **Transport/Additional information:** | |
| · **ADR** | |
| · **Excepted quantities (EQ):** | E1 |
| · **Limited quantities (LQ)** | 5L |
| · **Excepted quantities (EQ)** | Code: E1<br>Maximum net quantity per inner packaging: 30 ml<br>Maximum net quantity per outer packaging: 1000 ml |
| · **Transport category** | 3 |
| · **Tunnel restriction code** | E |
| · **IMDG** | |
| · **Limited quantities (LQ)** | 5L |
| · **Excepted quantities (EQ)** | Code: E1<br>Maximum net quantity per inner packaging: 30 ml<br>Maximum net quantity per outer packaging: 1000 ml |



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## 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**
None of the ingredients is 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:**
None of the ingredients is listed.

· **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** see item 3 SVHC
· **Substances of very high concern (SVHC) according to UK REACH** see item 3 SVHC

· **Directive 2012/18/EU (SEVESO III):**
· **Named dangerous substances - ANNEX I** None of the ingredients is listed.

· **REGULATION (EC) No 1907/2006 ANNEX XVII** Conditions of restriction: 3, 30

· **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).

· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

* 
## 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 Sheets 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.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H360FD May damage fertility. May damage the unborn child.

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· **Abbreviations and acronyms:**
EC50: effective concentration, 50 percent (in vivo)
ICAO: International Civil Aviation Organisation
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. 4: Acute toxicity – Category 4
Skin Corr. 1A: Skin corrosion/irritation – Category 1A
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
Repr. 1B: Reproductive toxicity – Category 1B

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

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