

## potassium hydroxide, solution aqueuse

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

#### 1.1. Product identifier

<b>Product name</b>	: potassium hydroxide, solution aqueuse
<b>Synonyms</b>	: potassium hydroxide (K(OH)); potassium hydroxide, 5%<conc<55%, aqueous solutions
<b>Registration number REACH</b>	: 01-2119487136-33-0000
<b>Product type REACH</b>	: Substance/mono-constituent
<b>CAS number</b>	: 1310-58-3
<b>EC index number</b>	: 019-002-00-8
<b>EC number</b>	: 215-181-3
<b>Molecular mass</b>	: 56.11 g/mol
<b>Formula</b>	: KOH

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

##### 1.2.1 Relevant identified uses

Distribution of the substance, loading and repacking (industrial and professional)  
 Formulation & (re)packing of substances and mixtures  
 Use as processing aid : pH-regulator, flocculant, precipitant, neutralization agent in the manufacturing of chemicals, pulp & paper, food, in regeneration of ion-exchange resins, in formulations like washing & cleaning products, fertilisers, developers for photography, metal working fluids, ... (industrial and professional)  
 Use in batteries (articles)  
 Use in detergents, paint strippers, drain deblockers, cosmetics, ... (consumer)  
 Use in detergents, paint strippers, drain deblockers, cosmetics, metal treatment products, extracting agents, water treatment or as laboratory chemicals (industrial and professional)  
 Industrial use as intermediate: manufacture of potassium salts, fertilisers, de-icers, pesticides, pigments, detergents, pharmaceuticals, food products, additives, cosmetics, ... (industrial and professional)

##### 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

Vynova Belgium NV  
 Heilig Hartlaan 21  
 B-3980 Tessenderlo  
 ☎ +32 13 61 23 00  
 sds.responsible@vynova-group.com

#### 1.4. Emergency telephone number

24h/24h :  
 +32 14 58 45 45 (BIG)

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

Classified as dangerous according to the criteria of Regulation (EC) No 1272/2008

Class	Category	Hazard statements
Met. Corr.	category 1	H290: May be corrosive to metals.
Acute Tox.	category 4	H302: Harmful if swallowed.
Skin Corr.	category 1A	H314: Causes severe skin burns and eye damage.
Eye Dam.	category 1	H318: Causes serious eye damage.

#### 2.2. Label elements



Contains: potassium hydroxide.

**Signal word** Danger

##### H-statements

H290	May be corrosive to metals.
H302	Harmful if swallowed.



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H314 Causes severe skin burns and eye damage.

## P-statements

- P280 Wear protective gloves, protective clothing and eye protection/face protection.  
 P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
 P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.  
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P310 Immediately call a POISON CENTER/doctor.

## 2.3. Other hazards

Warning! Product may cause floors to be slippery

## 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	M-factors and ATE
potassium hydroxide 01-2119487136-33	1310-58-3 215-181-3	5%<C<55%	Met. Corr. 1; H290 Acute Tox. 4; H302 Skin Corr. 1A; H314 Eye Dam. 1; H318 Skin Corr. 1A; H314: C ≥ 5 %, (CLP Annex VI (ATP 0)) Skin Corr. 1B; H314: 2 % ≤ C < 5%, (CLP Annex VI (ATP 0)) Skin Irrit. 2; H315: 0,5 % ≤ C < 2%, (CLP Annex VI (ATP 0)) Eye Irrit. 2; H319: 0,5 % ≤ C < 2 %, (CLP Annex VI (ATP 0))	(1)(2)	Constituent	

- (1) For H- and EUH-statements in full: see heading 16  
 (2) Substance with a Community workplace exposure limit

### 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:

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

#### After skin contact:

Wash immediately with lots of water (15 minutes)/shower. Remove clothing while washing. 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:

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

#### After ingestion:

Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Do not induce vomiting. Do not give activated charcoal. Do not give chemical antidote. Immediately consult a doctor/medical service.

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

#### 4.2.1 Acute symptoms

##### After inhalation:

EXPOSURE TO HIGH CONCENTRATIONS: Dry/sore throat. Corrosion of the upper respiratory tract. Respiratory difficulties. Possible laryngeal spasm/oedema. Risk of pneumonia. FOLLOWING SYMPTOMS MAY APPEAR LATER: Risk of lung oedema.

##### After skin contact:

Caustic burns/corrosion of the skin. Slow-healing wounds.

##### After eye contact:

Corrosion of the eye tissue. Permanent eye damage. Blindness.

##### After ingestion:

Abdominal pain. Blood in vomit. Difficulty in swallowing. Possible esophageal perforation. Burns to the gastric/intestinal mucosa. AFTER INGESTION OF HIGH QUANTITIES: Change in the haemogramme/blood composition. Disturbances of heart rate. Low arterial pressure. Blood in stool. Bleeding of the gastrointestinal tract. Shock.

#### 4.2.2 Delayed symptoms

No effects known.

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

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If applicable and available it will be listed below.

## 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 heating: release of corrosive gases/vapours.

### 5.3. Advice for firefighters

#### 5.3.1 Instructions:

Cool tanks/drums with water spray/remove them into safety. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it. Heat exposure: dilute toxic gas/vapour with water spray.

#### 5.3.2 Special protective equipment for fire-fighters:

Gloves (EN 374). Face shield (EN 166). Corrosion-proof suit (EN 14605). Large spills/in enclosed spaces: self-contained breathing apparatus (EN 136 + EN 137). Large spills/in enclosed spaces: gas-tight suit (EN 943). Heat/fire exposure: self-contained breathing apparatus (EN 136 + EN 137).

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

No naked flames. Corrosion-proof appliances. Large spills/in confined spaces: consider evacuation.

#### 6.1.1 Protective equipment for non-emergency personnel

See heading 8.2

#### 6.1.2 Protective equipment for emergency responders

Gloves (EN 374). Face shield (EN 166). Corrosion-proof suit (EN 14605). Large spills/in enclosed spaces: self-contained breathing apparatus (EN 136 + EN 137). Large spills/in enclosed spaces: gas-tight suit (EN 943).

#### Suitable protective clothing

See heading 8.2

### 6.2. Environmental precautions

Contain released product, pump into suitable containers. Plug the leak, cut off the supply. Dam up the liquid spill. Take account of toxic/corrosive precipitation water. Prevent soil and water pollution. Prevent spreading in sewers.

### 6.3. Methods and material for containment and cleaning up

Take up liquid spill into inert absorbent material, e.g.: powdered limestone or dry sand/earth. Scoop absorbed substance into closing containers. Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. Take collected spill to manufacturer/competent authority. Neutralize small quantities of the liquid spill with sodium bisulfite. Wash away neutralized product with plentiful water. Clean contaminated surfaces with an excess of water. 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

Observe very strict hygiene - avoid contact. Safety showers and eye wash fountains should be readily available in handling and storage areas. Remove contaminated clothing immediately. Use corrosionproof equipment. Do not discharge the waste into the drain. Never dilute by pouring water to the product. Always add the product to the water. Keep container tightly closed. Avoid splashing.

### 7.2. Conditions for safe storage, including any incompatibilities

#### 7.2.1 Safe storage requirements:

Storage temperature: 20 °C. Store in a dry area. Keep out of direct sunlight. Keep container in a well-ventilated place. Protect against frost. Keep locked up. Provide for a tub to collect spills. Unauthorized persons are not admitted. May be stored under inert gas. Meet the legal requirements.

#### 7.2.2 Keep away from:

Heat sources, oxidizing agents, (strong) acids, highly flammable materials, metals, halogens, organic materials.

#### 7.2.3 Suitable packaging material:

Steel, stainless steel, carbon steel, nickel, cardboard, polyethylene, iron, synthetic material, glass, stoneware/porcelain, steel with rubber inner lining.

#### 7.2.4 Non suitable packaging material:

Lead, aluminium, copper, tin, zinc, bronze.

### 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

Potassium (hydroxyde de)	Short time value	2 mg/m <sup>3</sup> (M)
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La mention "M" indique que lors d'une exposition supérieure à la valeur limite, des irritations apparaissent ou un danger d'intoxication aiguë existe. Le procédé de travail doit être conçu de telle façon que l'exposition ne dépasse jamais la valeur limite. Lors des mesurages, la période d'échantillonnage doit être aussi courte que possible afin de pouvoir effectuer des mesurages fiables. Le résultat des mesurages est calculé en fonction de la période d'échantillonnage.

##### France

Potassium (hydroxyde de)	Short time value (VL: Valeur non réglementaire indicative)	2 mg/m <sup>3</sup>
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##### UK

Potassium hydroxide	Short time value (Workplace exposure limit (EH40/2005))	2 mg/m <sup>3</sup>
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##### USA (TLV-ACGIH)

Potassium hydroxide	Momentary value (TLV - Adopted Value)	2 mg/m <sup>3</sup>
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##### b) National biological limit values

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

#### 8.1.2 Sampling methods

If applicable and available it will be listed below.

#### 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

potassium hydroxide

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term local effects inhalation	1 mg/m <sup>3</sup>	

##### DNEL/DMEL - General population

potassium hydroxide

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term local effects inhalation	1 mg/m <sup>3</sup>	

#### 8.1.5 Control banding

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

Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.

#### 8.2.2 Individual protection measures, such as personal protective equipment

Observe very strict hygiene - avoid contact. Safety showers and eye wash fountains should be readily available in handling and storage areas. Do not eat, drink or smoke during work.

##### a) Respiratory protection:

Full face mask with filter type B at conc. in air > exposure limit. High vapour/gas concentration: self-contained breathing apparatus (EN 136 + EN 137).

##### b) Hand protection:

Gloves.

Materials	Remark
butyl rubber	Excellent resistance
natural rubber	Excellent resistance
neoprene	Excellent resistance
PVC	Excellent resistance
viton	Excellent resistance
chlorosulfonated polyethylene	Good resistance
tetrafluoroethylene	Good resistance
nitrile rubber/PVC	Good resistance
nitrile rubber	Good resistance
polyethylene	Less resistance
polyurethane	Less resistance
styrene-butadiene rubber	Less resistance
neoprene/SBR	Less resistance
leather	Poor resistance
natural fibres	Poor resistance
PVA	Poor resistance



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**c) Eye protection:**

Face shield (EN 166).

**d) Skin protection:**

Corrosion-proof clothing (EN 14605).

**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	Liquid
Viscosity	Viscous
Odour	Odourless
Odour threshold	Not applicable
Colour	Colourless
Translucency	Clear
Particle size	Not applicable (liquid)
Explosion limits	Not applicable
Flammability	Non-flammable
Log Kow	Not applicable (mixture)
Dynamic viscosity	0.0087 Pa.s ; 20 °C
Kinematic viscosity	No data available
Melting point	6 °C
Boiling point	145 °C
Relative vapour density	No data available
Vapour pressure	No data available
Solubility	Water ; miscible
Relative density	1.5 ; 20 °C
Absolute density	1513 kg/m <sup>3</sup>
Decomposition temperature	Not applicable
Auto-ignition temperature	Not applicable
Flash point	Not applicable
pH	14 ; 5 %

### 9.2. Other information

Solidification (freezing) point	10 °C
Evaporation rate	No data available
Explosive properties	No chemical group associated with explosive properties
Oxidising properties	No chemical group associated with oxidising properties

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Basic reaction. May be corrosive to metals.

### 10.2. Chemical stability

Absorbs the atmospheric CO<sub>2</sub>.

### 10.3. Possibility of hazardous reactions

May be corrosive to metals. Absorbs the atmospheric CO<sub>2</sub>. Violent to explosive reaction with many compounds e.g.: with organic material, with (some) halogens and with (some) acids: heat release resulting in increased fire or explosion risk.

### 10.4. Conditions to avoid

No data available.

### 10.5. Incompatible materials

Oxidizing agents, (strong) acids, highly flammable materials, metals, halogens, organic materials.

### 10.6. Hazardous decomposition products

Reacts with (some) metals and their compounds: release of highly flammable gases/vapours (hydrogen). On heating: release of corrosive gases/vapours.

## SECTION 11: Toxicological information

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

#### 11.1.1 Test results

#### Acute toxicity

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Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral			category 4			Annex VI	

potassium hydroxide

Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral	LD50	Equivalent to OECD 425	333 mg/kg bw - 388 mg/kg bw		Rat (male)	Experimental value	
Dermal						Data waiving	
Inhalation						Data waiving	

**Conclusion**

Harmful if swallowed.

**Corrosion/irritation**

potassium hydroxide, solution aqueuse

No (test)data available

potassium hydroxide

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark
Eye	Serious eye damage	Equivalent to OECD 405	5 minutes		Rabbit	Experimental value	5% aqueous solution
Skin	Corrosive	Equivalent to OECD 404	4 h	24; 48 hours	Rabbit	Experimental value	10 % aqueous solution
Inhalation	Irritating	Human observation			Human	Read-across (NaOH)	

**Conclusion**

Causes severe skin burns and eye damage.

**Respiratory or skin sensitisation**

potassium hydroxide, solution aqueuse

No (test)data available

potassium hydroxide

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Skin	Not sensitizing	Other		24 hours	Guinea pig (male)	Experimental value	

**Conclusion**

Not classified as sensitizing for skin

**Specific target organ toxicity**

potassium hydroxide, solution aqueuse

No (test)data available

potassium hydroxide

Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Value determination
Oral								Data waiving
Dermal								Data waiving
Inhalation								Data waiving

**Conclusion**

Not classified for subchronic toxicity

**Mutagenicity (in vitro)**

potassium hydroxide, solution aqueuse

No (test)data available

potassium hydroxide

Result	Method	Test substrate	Effect	Value determination	Remark
Negative with metabolic activation, negative without metabolic activation	Ames test	Bacteria (S.typhimurium)		Experimental value	

**Mutagenicity (in vivo)**

potassium hydroxide, solution aqueuse

No (test)data available

potassium hydroxide

Result	Method	Exposure time	Test substrate	Organ	Value determination
					Data waiving

**Conclusion**

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Not classified for mutagenic or genotoxic toxicity

## Carcinogenicity

potassium hydroxide, solution aqueuse

No (test)data available

potassium hydroxide

Route of exposure	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Unknown								Data waiving

### Conclusion

Not classified for carcinogenicity

## Reproductive toxicity

potassium hydroxide, solution aqueuse

No (test)data available

potassium hydroxide

	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Developmental toxicity								Data waiving
Effects on fertility								Data waiving

### Conclusion

Not classified for reprotoxic or developmental toxicity

## Toxicity other effects

potassium hydroxide, solution aqueuse

No (test)data available

## Chronic effects from short and long-term exposure

potassium hydroxide, solution aqueuse

ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Dry skin. Skin rash/inflammation.

### 11.2. Information on other hazards

No evidence of endocrine disrupting properties

## SECTION 12: Ecological information

### 12.1. Toxicity

potassium hydroxide, solution aqueuse

No (test)data available

Judgement of the mixture is based on the relevant ingredients

### Conclusion

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

### 12.2. Persistence and degradability

Water

Biodegradability: not applicable

### 12.3. Bioaccumulative potential

potassium hydroxide, solution aqueuse

#### Log Kow

Method	Remark	Value	Temperature	Value determination
	Not applicable (mixture)			

potassium hydroxide

#### Log Kow

Method	Remark	Value	Temperature	Value determination
	No data available			

### Conclusion

Does not contain bioaccumulative component(s)

### 12.4. Mobility in soil

No (test)data on mobility of the component(s) available

### 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. Endocrine disrupting properties

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No evidence of endocrine disrupting properties

## 12.7. Other adverse effects

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### Greenhouse gases

None of the known components is 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)

potassium hydroxide

### Groundwater

Groundwater pollutant

## 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

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).

06 02 04\* (wastes from the MFSU of bases: sodium and potassium hydroxide). 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. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Do not discharge into drains or the environment.

#### 13.1.3 Packaging/Container

##### European Union

Waste material code packaging (Directive 2008/98/EC).

15 01 10\* (packaging containing residues of or contaminated by dangerous substances).

## SECTION 14: Transport information

### Road (ADR)

#### 14.1. UN number

UN number	1814
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#### 14.2. UN proper shipping name

Proper shipping name	Potassium hydroxide solution
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#### 14.3. Transport hazard class(es)

Hazard identification number	80
Class	8
Classification code	C5

#### 14.4. Packing group

Packing group	II
Labels	8

#### 14.5. Environmental hazards

Environmentally hazardous substance mark	no
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#### 14.6. Special precautions for user

Special provisions	
Limited quantities	Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass)

### Rail (RID)

#### 14.1. UN number

UN number	1814
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#### 14.2. UN proper shipping name

Proper shipping name	Potassium hydroxide solution
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#### 14.3. Transport hazard class(es)

Hazard identification number	80
Class	8
Classification code	C5

#### 14.4. Packing group

Packing group	II
Labels	8

#### 14.5. Environmental hazards

Environmentally hazardous substance mark	no
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#### 14.6. Special precautions for user

Special provisions	
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Limited quantities	Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass)
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## Inland waterways (ADN)

14.1. UN number	
UN number	1814
14.2. UN proper shipping name	
Proper shipping name	Potassium hydroxide solution
14.3. Transport hazard class(es)	
Class	8
Classification code	C5
14.4. Packing group	
Packing group	II
Labels	8
14.5. Environmental hazards	
Environmentally hazardous substance mark	no
14.6. Special precautions for user	
Special provisions	
Limited quantities	Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass)

## Sea (IMDG/IMSBC)

14.1. UN number	
UN number	1814
14.2. UN proper shipping name	
Proper shipping name	potassium hydroxide solution
14.3. Transport hazard class(es)	
Class	8
14.4. Packing group	
Packing group	II
Labels	8
14.5. Environmental hazards	
Marine pollutant	-
Environmentally hazardous substance mark	no
14.6. Special precautions for user	
Special provisions	
Limited quantities	Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass)
14.7. Maritime transport in bulk according to IMO instruments	
Annex II of MARPOL 73/78	Not applicable, based on available data

## Air (ICAO-TI/IATA-DGR)

14.1. UN number	
UN number	1814
14.2. UN proper shipping name	
Proper shipping name	Potassium hydroxide solution
14.3. Transport hazard class(es)	
Class	8
14.4. Packing group	
Packing group	II
Labels	8
14.5. Environmental hazards	
Environmentally hazardous substance mark	no
14.6. Special precautions for user	
Special provisions	A3
Special provisions	A803
Passenger and cargo transport	
Limited quantities: maximum net quantity per packaging	0.5 L

## 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 Annex XVII - Restriction

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.

Reference legislation

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See column 1: 3.

## National legislation The Netherlands

Waterbezwaarlijkheid	B (5); Algemene Beoordelingsmethodiek (ABM)
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## National legislation Germany

WGK	1; Classification water polluting based on the components in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 27 July 2005 (Anhang 4)
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## 15.2. Chemical safety assessment

A chemical safety assessment has been performed.

## SECTION 16: Other information

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

H290 May be corrosive to metals.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

(*)	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 %
EC50	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

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## ANNEX TO THE EXTENDED SAFETY DATA SHEET (eSDS)

### Overview

### Appendix: Exposure scenarios

#### List of Exposure Scenarios

Exposure Scenario 1: Industrial and professional use of KOH

Exposure Scenario 2: Consumer use of solid and liquid KOH (excl. batteries)

Exposure Scenario 3: Consumer use, service life & waste stage of KOH in batteries

### Exposure scenarios and corresponding use descriptors

Exposure scenarios	Title of Exposure Scenario	PC	SU	PROC	AC	ERC
ES1	Industrial and professional use of KOH	0-40	1-23	1-20	Not applicable	1-11b
ES2	Consumer use of solid and liquid KOH (excl. batteries)	9, 12, 20, 28, 35, 39	21	Not applicable	Not applicable	8a, 8b, 8d, 9a
ES3	Consumer use, service life & waste stage of KOH in batteries	Not applicable	21	Not applicable	3	9a, 9b

## ANNEX TO THE EXTENDED SAFETY DATA SHEET (eSDS)

### Exposure Scenario 1: Industrial and professional use of KOH

Section 1. Title of Exposure Scenario	
Title	Industrial and professional use of KOH
Systematic title based on use descriptor	/
Sectors of use:	SU1 - Agriculture, forestry, fishery SU2a - Mining, (without offshore industries) SU2b - Offshore industries SU3 - Industrial uses SU4 - Manufacture of food products SU5 - Manufacture of textiles, leather, fur SU6a - Manufacture of wood and wood products SU6b - Manufacture of pulp, paper and paper products SU7 - Printing and reproduction of recorded media SU8 - Manufacture of bulk, large scale chemicals (including petroleum products) SU9 - Manufacture of fine chemicals SU10 - Formulation SU11 - Manufacture of rubber products SU12 - Manufacture of plastics products, including compounding and conversion SU13 - Manufacture of other non-metallic mineral products, e.g. plasters, cement SU14 - Manufacture of basic metals, including alloys SU15 - Manufacture of fabricated metal products, except machinery and equipment SU16 - Manufacture of computer, electronic and optical products, electrical equipment SU17 - General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment SU18 - Manufacture of furniture SU19 - Building and construction work SU20 - Health services SU21 - Consumer uses SU22 - Professional uses SU23 - Electricity, steam, gas water supply and sewage treatment
Environmental release categories:	ERC1 - Manufacture of the substance ERC2 - Formulation into mixture ERC3 - Formulation into solid matrix ERC4 - Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC5 - Use at industrial site leading to inclusion into/onto article ERC6a - Use of intermediate ERC6b - Use of reactive processing aid at industrial site (no inclusion into or onto article) ERC6c - Use of monomer in polymerization processes at industrial site (inclusion or not into/onto article) ERC6d - Use of reactive process regulators in polymerization processes at industrial site (inclusion or not into/onto article) ERC7 - Use of functional fluid at industrial site ERC8a - Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC8b - Widespread use of reactive processing aid (no inclusion into or onto article, indoor) ERC8c - Widespread use leading to inclusion into/onto article (indoor) ERC8d - Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) ERC8e - Widespread use of reactive processing aid (no inclusion into or onto article, outdoor) ERC8f - Widespread use leading to inclusion into/onto article (outdoor) ERC9a - Widespread use of functional fluid (indoor) ERC9b - Widespread use of functional fluid (outdoor) ERC10a - Widespread use of articles with low release (outdoor) ERC10b - Widespread use of articles with high or intended release (outdoor) ERC11a - Widespread use of articles with low release (indoor) ERC11b - Widespread use of articles with high or intended release (indoor)

### Exposure Scenario 1: Industrial and professional use of KOH

Process categories:	<p>PROC 1 - Use in closed process, no likelihood of exposure</p> <p>PROC 2 - Use in closed, continuous process with occasional controlled exposure (e.g. sampling)</p> <p>PROC 3 - Use in closed batch process (synthesis or formulation)</p> <p>PROC 4 - Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC 5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC 6 - Calendering operations</p> <p>PROC 7 - Industrial spraying</p> <p>PROC 8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC 8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC 9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC 10 - Roller application or brushing</p> <p>PROC 11 - Non industrial spraying</p> <p>PROC 12 - Use of blowing agents in manufacture of foam</p> <p>PROC 13 - Treatment of articles by dipping and pouring</p> <p>PROC 14 - Production of preparations or articles by tableting, compression, extrusion, pelletization</p> <p>PROC 15 - Use as laboratory reagent</p> <p>PROC 16 - Using material as fuel sources, limited exposure to unburned product to be expected</p> <p>PROC 17 - Lubrication at high energy conditions and in partly open process</p> <p>PROC 18 - Greasing at high energy conditions</p> <p>PROC 19 - Hand-mixing with intimate contact and only PPE available.</p> <p>PROC 20 - Heat and pressure transfer fluids in dispersive, professional use but closed systems</p>
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## Exposure Scenario 1: Industrial and professional use of KOH

<b>Section 2. Operational conditions and risk management measures</b>	
<b>2.1. Control of environmental exposure</b>	
<b>Characteristics of chemical products</b>	
Physical form of the product	Solid/ Liquid.
Concentration of substance in product	Covers percentage substance in the product up to 100 %. Solid: Low dustiness.
Frequency and duration of use	Continuous.
<b>Technical on site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	
<p>Risk management measures related to the environment aim to avoid discharging KOH solutions into municipal wastewater or to surface water, in case such discharges are expected to cause significant and undesired pH changes. Adequate control of the pH value during introduction into open waters is required. In general, discharges should be carried out such that pH changes in receiving surface waters are minimized. In general, most aquatic organisms can tolerate pH values in the range of 6-9. This is also reflected in the description of standard OECD tests with aquatic organisms.</p> <p>There are additionally some specific environmental risk management measures related to fertilizers containing up to 20% of KOH in the end product. Direct releases to adjacent surface waters should be avoided. Drift should be minimized. And in line with the requirements for good agricultural practice, agricultural soil should be analyzed prior to application of the fertilizer and the application rate should be adjusted according to the results of the analysis. Physical form of the product</p>	
<b>Conditions and measures related to external treatment of waste for disposal</b>	
There is no solid waste of KOH. Liquid waste should be reused or discharged to the industrial wastewater and further neutralized if needed.	
<b>2.2. Control of worker exposure</b>	
<b>Characteristics of chemical products</b>	
Physical form of the product	Solid/ Liquid.
Concentration of substance in product	Covers percentage substance in the product up to 100 %. Solid: Low dustiness.
Frequency and duration of use	8 hour(s)/ day, 200 days/ Year(s).
<b>Technical conditions and measures at process level (source) to prevent release</b>	
<p>Worker (Both solid and liquid KOH containing products at concentration &gt; 2%):</p> <p>Replacing, where appropriated, manual processes by automated and/or closed processes. This would avoid irritating mists, sprayings and subsequent potential splashes:</p> <ul style="list-style-type: none"> <li>• Use closed systems or covering of open containers (e.g. screens)</li> <li>• Transport over pipes, technical barrel filling/emptying of barrel with automatic systems (suction pumps etc.)</li> <li>• Use of pliers, grip arms with long handles with manual use "to avoid direct contact and exposure by splashes (no working over one's head)"</li> </ul>	
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	
Worker (Both solid and liquid KOH containing products at concentration > 2%): Local exhaust ventilation and/or general ventilation is good practice.	
<b>Organizational measures to prevent/limit releases, dispersion and exposure</b>	
<p>Worker (Both solid and liquid KOH containing products at concentration &gt; 2%):</p> <ul style="list-style-type: none"> <li>• Workers in the risky process/areas identified should be trained a) to avoid to work without respiratory protection and b) to understand the corrosive properties and, especially, the respiratory inhalation effects of potassium hydroxide and c) to follow the safer procedures instructed by the employer.</li> <li>• The employer has also to ascertain that the required PPE is available and used according to instructions.</li> </ul> <p>Where possible for professional use, use of specific dispensers and pumps specifically designed to prevent splashes/spills/exposure to occur.</p>	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<p>Worker/ Professional (Both solid and liquid KOH containing products at concentration &gt; 2%):</p> <ul style="list-style-type: none"> <li>• Respiratory protection: In case of dust or aerosol formation (e.g. spraying): A suitable dust mask or dust respirator with filter type P may be appropriate.</li> <li>• Hand protection: Impervious gloves. <ul style="list-style-type: none"> <li>○ Material: Butyl rubber, PVC, polychloroprene with natural latex liner Material thickness: 0.5mm</li> <li>○ Breakthrough time: &gt;480 min</li> <li>○ Material: Nitrile rubber, fluorinated rubber Material thickness: 0.35 – 0.40 mm Breakthrough time: &gt;480 min</li> </ul> </li> </ul> <p>If splashes are likely to occur: Safety spectacles/goggles/full face shield. Apron or other light protective clothing, boots and synthetic rubber gloves.</p>	

### Exposure Scenario 1: Industrial and professional use of KOH

#### Section 3. Exposure Estimation

##### 3.1. Environment

The aquatic effect and risk assessment only deals with the effect on organisms/ecosystems due to possible pH changes related to OH<sup>-</sup> discharges, as the toxicity of the K<sup>+</sup> ion is expected to be insignificant compared to the (potential) pH effect. The high water solubility and very low vapors pressure indicate that KOH will be found predominantly in water.

When the risk management measures related to the environment are implemented, there is no exposure to the activated sludge of a sewage treatment plant and there is not exposure of the receiving surface water.

The sediment compartment is not considered, because it is not considered relevant for KOH. If emitted to the aquatic compartment, sorption to sediment particles will be negligible.

Significant emissions to air are not expected due to the very low vapor pressure of KOH. If emitted to air as an aerosol in water, KOH will be rapidly neutralized as a result of its reaction with CO<sub>2</sub> (or other acids).

Significant emissions to the terrestrial environment are not expected either. The sludge application route is not relevant for the emission to agricultural soil, as no sorption of KOH to particulate matter will occur in STPs/WWTPs. If emitted to soil, sorption to soil particles will be negligible. Depending on the buffer capacity of the soil, OH<sup>-</sup> will be neutralized in the soil pore water or the pH may increase.

The substance has no potential for bioaccumulation.

##### 3.2. Worker

KOH is a corrosive substance. For the handling of corrosive substances and formulations, immediate dermal contacts occur only occasionally and it is assumed that repeated daily dermal exposure can be neglected. Therefore, dermal exposure to KOH was not quantified.

KOH is not expected to be systemically available in the body under normal handling and use conditions and therefore systemic effects of KOH after dermal or inhalation exposure are not expected to occur.

The ECETOC TRA tool has been used to estimate the inhalation exposure (see Table below).

It was assumed that there is no local exhaust ventilation and no respiratory protection unless specified otherwise. The duration of exposure was set at more than 4 hours per day as a worst-case assumption and professional use was specified where relevant as a worst-case assumption. For the solid, the low dustiness class was selected because KOH is very hygroscopic. Only the most relevant PROCs were considered in the assessment.

The maximum estimated inhalation concentration is 0.6 mg/m<sup>3</sup>. This value has been used for risk characterization. Taken into account the DNEL (acute/long-term inhalation-local) of 1 mg/m<sup>3</sup>: the Risk Characterization Ratio (RCR) = 0.6

## ANNEX TO THE EXTENDED SAFETY DATA SHEET (eSDS)

### Exposure Scenario 1: Industrial and professional use of KOH

Process Category [PROC]	Process category description	Liquid (mg/m <sup>3</sup> )	Solid (mg/m <sup>3</sup> )
		ECETOC TRA v3	Worst-case of ECETOC TRA v3 and MEASE 1.02
PROC 1	Use in closed process, no likelihood of exposure	0,01	0,01
PROC 2	Use in closed, continuous process with occasional controlled exposure (e.g. sampling)	0,1	0,01
PROC 3	Use in closed batch process (synthesis or formulation)	0,1	0,1
PROC 4	Use in batch and other process (synthesis) where opportunity for exposure arises	0,1	0,6 (< 4 h duration)
PROC 5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	0,1	0,6 (< 4 h duration)
PROC 6	Calendering operations	0,1	0,6 (< 4 h duration)
PROC 7	Spraying in industrial settings and applications		0,6 (< 4 h duration)
PROC 8	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities	0,1	0,5
PROC 9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	0,1	0,5
PROC10	Roller application or brushing of adhesive and other coating		0,5
PROC11	Spraying outside industrial settings or applications	0,5 (<15 min duration, 95% RPE)	0,6 (< 4 h duration)
PROC12	Use of blow agents in manufacture of foam	0,25 (<15 min duration, 75% RPE)	0,6 (< 4 h duration)
PROC13	Treatment of articles by dipping and pouring	0,1	0,5
PROC14	Production of preparations or articles by tableting, compression, extrusion, pelettisation	0,1	0,6 (< 4 h duration)
PROC15	Use a laboratory reagent	0,1	0,6 (< 4 h duration)
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected	0,1	0,5 (<15 min duration)
PROC17	Lubrication at high energy conditions and in partly open process	0,5 (<15 min duration, 90% RPE)	0,25 (<15 min duration, 75% RPE)
PROC18	Greasing at high energy conditions	0,5 (<15 min duration, 90% RPE)	0,25 (<15 min duration, 75% RPE)
PROC19	Hand-mixing with intimate contact and only PPE available.	0,62 (<15 min duration, 75% RPE)	0,5 (<15 min duration)
PROC20	Heat and pressure transfer fluids in dispersive use but closed systems	0,1	0,5

#### Section 4. Guidance to check compliance with the Exposure Scenario

##### 4.1. Health

Evaluation guidance to downstream user	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels
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##### 4.2. Environment

Evaluation guidance to downstream user	Guidance is based on assumed operating conditions, which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.
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## ANNEX TO THE EXTENDED SAFETY DATA SHEET (eSDS)

### Exposure Scenario 2: Consumer use of solid and liquid KOH (excl. batteries)

Section 1. Title of Exposure Scenario	
Title	Consumer use of solid and liquid KOH (excl. batteries)
Systematic title based on use descriptor	
Sectors of use:	SU21 - Consumer uses: Private households
Product categories:	PC9a - Coatings and paints, thinners, paint removers PC9b Fillers, putties, plasters, modelling clay PC12 - Fertilizers PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents PC28 Perfumes, fragrances PC35 - Washing and cleaning products (including solvent based products) PC39 Cosmetics, personal care products
Environmental release categories:	However, it could potentially also be used in other chemical product categories (PC 0 -40) ERC8a - Wide dispersive indoor use of processing aids in open systems ERC8b - Wide dispersive indoor use of reactive substances in open systems ERC8d - Wide dispersive outdoor use of processing aids in open systems ERC9a - Wide dispersive indoor use of substances in closed systems  The environmental release categories mentioned above are assumed the most important ones but other wide dispersive environmental release categories could also be possible (ERC 8 - 11b).

## ANNEX TO THE EXTENDED SAFETY DATA SHEET (eSDS)

### Exposure Scenario 2: Consumer use of solid and liquid KOH (excl. batteries)

Section 2. Operational conditions and risk management measures	
<b>2.1. Control of environmental exposure</b>	
<b>Characteristics of chemical products</b>	
Physical form of the product	Solid/ Liquid.
Concentration of substance in product	Covers percentage substance in the product up to 100 %. Solid: Low dustiness.
Frequency and duration of use	Continuous.
<b>Technical on site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	
This material and its container must be disposed of in a safe way (e.g. by returning to a public recycling facility). If container is empty, dispose as regular municipal waste.	
<b>2.2. Control of worker exposure</b>	
<b>Characteristics of chemical products</b>	
Physical form of the product	Solid/ Liquid.
Concentration of substance in product	Covers percentage substance in the product up to 100 %. Solid: Low dustiness. Practically no KOH is left in the final consumer product, as the amounts used will interact with other ingredients in acid- base reactions. However, some cleaning products may contain 0.25-0.45% of KOH in the final formulation. Some toilet cleaners may contain up to 1.1% and certain soaps contain up to 0.5% of KOH in the final formulation.
Conditions and measures related to the design of the product	<ul style="list-style-type: none"> <li>It is required to use resistant labelling-package to avoid its auto-damage and loss of the label integrity, under normal use and storage of the product. The lack of quality of the package provokes the physical loss of information on hazards and use instructions.</li> <li>It is required that household chemicals, containing KOH for more than 2%, which may be accessible to children should be provided with a child-resistant fastening (currently applied) and a tactile warning of danger (Adaptation to Technical Progress of the Directive 1999/45/EC, annex IV, Part A and Article 15(2) of Directive 67/548 in the case of, respectively, dangerous preparations and substances intended for domestic use). This would prevent accidents by children and other sensitive groups of society.</li> <li>It is advisable to deliver only in very viscous preparations.</li> <li>It is advisable to delivery only in small amounts.</li> </ul>
Conditions and measures related to information and behavioral advice to consumers	<p>It is required that appropriate use instructions, and product information should always be provided to consumers. This clearly can reduce the risk of misuse. For reducing the number of accidents, it is advisable to use these products in the absence of children or other potential sensitive groups. To prevent improper use of KOH, instructions for use should contain a warning against dangerous mixtures.</p> <p>Instructions addressed to consumers:</p> <ul style="list-style-type: none"> <li>Keep out of reach of children.</li> <li>Do not apply product into ventilator openings or slots.</li> </ul>
Conditions and measures related to personal protection, hygiene and health evaluation	<p>Both solid and liquid KOH containing products at concentration &gt; 2%:</p> <ul style="list-style-type: none"> <li>Respiratory protection: In case of dust or aerosol formation (e.g. spraying): A suitable dust mask or dust respirator with filter type P may be appropriate.</li> <li>Hand protection: Impervious gloves.</li> <li>If splashes are likely to occur: Safety spectacles/goggles/full face shield.</li> </ul>

## ANNEX TO THE EXTENDED SAFETY DATA SHEET (eSDS)

### Exposure Scenario 2: Consumer use of solid and liquid KOH (excl. batteries)

#### Section 3. Exposure Estimation

##### 3.1. Environment

Consumer uses relates to already diluted products, which will further be neutralized quickly in the sewer, well before reaching a wastewater treatment plant or surface water.

##### 3.2. Consumer

If the recommended Risk Management Measures (RMMs) are respected, local exposure through inhalation will not be higher compared to inhalation exposures in ES1. Therefore, the consumer exposure through inhalation was not further quantified.

#### Section 4. Guidance to check compliance with the Exposure Scenario

##### 4.1. Health

Evaluation guidance to downstream user	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels
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##### 4.2. Environment

Evaluation guidance to downstream user	Guidance is based on assumed operating conditions, which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.
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## ANNEX TO THE EXTENDED SAFETY DATA SHEET (eSDS)

### Exposure Scenario 3: Consumer use, service life & waste stage of KOH batteries

#### Section 1. Title of Exposure Scenario

Title	Consumer use, service life and waste stage of KOH in batteries
Systematic title based on use descriptor	/
Sectors of use:	SU21 - Consumer uses: Private households
Article categories:	AC3 - Electrical batteries and accumulators
Environmental release categories:	ERC9a - Wide dispersive indoor use of substances in closed systems ERC9b Wide dispersive outdoor use of substances in closed systems

#### Section 2. Operational conditions and risk management measures

##### 2.1. Control of environmental exposure

###### Characteristics of chemical products

Physical form of the product	Liquid.
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###### Conditions and measures related to external treatment of waste for disposal

Batteries should be recycled as much as possible (e.g. by returning to a public recycling facility). Recovery of KOH from alkaline batteries includes emptying the electrolyte, collection and neutralization with sulphuric acid and carbon dioxide. The occupational exposure related to these steps are considered in the exposure scenario on industrial and professional use of KOH.

##### 2.2. Control of worker exposure

###### Characteristics of chemical products

Physical form of the product	Liquid.
Conditions and measures related to the design of the product	It is required to use completely sealed articles with a long service life maintenance. It is advisable to delivery only in small amounts.

#### Section 3. Exposure Estimation

##### 3.1. Environment

The environmental release from the consumer use during service life is negligible because batteries are sealed articles with long service life maintenance. After use, batteries normally are recycled.

##### 3.2. Consumer

Consumer exposure is negligible because batteries are sealed articles with long service life maintenance. During waste phase, exposure to consumers is also negligible as batteries normally are recycled.

#### Section 4. Guidance to check compliance with the Exposure Scenario

##### 4.1. Health

Evaluation guidance to downstream user	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels
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##### 4.2. Environment

Evaluation guidance to downstream user	Guidance is based on assumed operating conditions, which may not be applicable to all sites; thus, scaling could be necessary to define appropriate site-specific risk management measures. If scaling reveals a condition of unsafe use, additional RMMs or a site-specific chemical safety assessment is required.
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