

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 24.02.2017

Version 18.2

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

### 1.1 Product identifier

Catalogue No. 105432

Product name Ammonia solution 25% for analysis EMSURE®

REACH Registration Number This product is a mixture. REACH Registration Number see section 3.

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

Identified uses Reagent for analysis, Chemical production  
In compliance with the conditions described in the annex to this safety data sheet.

### 1.3 Details of the supplier of the safety data sheet

Company Merck KGaA \* 64271 Darmstadt \* Germany \* Phone:+49 6151 72-0

Responsible Department LS-QHC \* e-mail: prodsafe@merckgroup.com

1.4 Emergency telephone number Please contact the regional company representation in your country.

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## SECTION 2. Hazards identification

### 2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

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Corrosive to metals, Category 1, H290

Skin corrosion, Category 1B, H314

Specific target organ toxicity - single exposure, Category 3, Respiratory system, H335

Acute aquatic toxicity, Category 1, H400

For the full text of the H-Statements mentioned in this Section, see Section 16.

## 2.2 Label elements

**Labelling (REGULATION (EC) No 1272/2008)**

*Hazard pictograms*



*Signal word*

Danger

*Hazard statements*

H290 May be corrosive to metals.

H314 Causes severe skin burns and eye damage.

H335 May cause respiratory irritation.

H400 Very toxic to aquatic life.

*Precautionary statements*

Prevention

P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response

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

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 or doctor/ physician.

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## Reduced labelling (≤125 ml)

### Hazard pictograms



### Signal word

Danger

### Hazard statements

H314 Causes severe skin burns and eye damage.

### Precautionary statements

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

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

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 or doctor/ physician.

## 2.3 Other hazards

None known.

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## SECTION 3. Composition/information on ingredients

Chemical nature Aqueous ammoniacal solution.

### 3.1 Substance

Not applicable

### 3.2 Mixture

#### Hazardous components (REGULATION (EC) No 1272/2008)

##### Chemical name (Concentration)

CAS-No. Registration number Classification

ammonia solution (>= 25 % - < 50 %)

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

1336-21-6 01-2119488876-14-

xxxx

Corrosive to metals, Category 1, H290

Skin corrosion, Category 1B, H314

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Specific target organ toxicity - single exposure, Category 3, H335  
Acute aquatic toxicity, Category 1, H400

For the full text of the H-Statements mentioned in this Section, see Section 16.

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## SECTION 4. First aid measures

### 4.1 Description of first aid measures

#### *General advice*

First aider needs to protect himself.

After inhalation: fresh air. Call in physician.

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

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

Irritation and corrosion, bronchitis, Cough, Shortness of breath, gastric pain, Unconsciousness, Bloody vomiting, Nausea, collapse, shock, Convulsions, Lung oedema, death  
Risk of blindness!

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

No information available.

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## SECTION 5. Firefighting measures

### 5.1 Extinguishing media

#### *Suitable extinguishing media*

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

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## *Unsuitable extinguishing media*

For this substance/mixture no limitations of extinguishing agents are given.

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

Not combustible.

Ammonia solution itself is not flammable, but can form an ignitable ammonia/air-mixture by outgassing.

Ambient fire may liberate hazardous vapours.

Fire may cause evolution of:

nitrogen oxides

## **5.3 Advice for firefighters**

### *Special protective equipment for firefighters*

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

### *Further information*

Cool closed containers exposed to fire with water spray. Suppress (knock down) gases/vapours/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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## **SECTION 6. Accidental release measures**

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

Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders:

Protective equipment see section 8.

### **6.2 Environmental precautions**

Do not empty into drains.

### **6.3 Methods and materials for containment and cleaning up**

Cover drains. Collect, bind, and pump off spills.

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Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent and neutralising material (e.g. Chemizorb® OH<sup>-</sup>, Merck Art. No. 101596). Dispose of properly. Clean up affected area.

## 6.4 Reference to other sections

Indications about waste treatment see section 13.

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## SECTION 7. Handling and storage

### 7.1 Precautions for safe handling

#### *Advice on safe handling*

Observe label precautions.

#### *Hygiene measures*

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

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

#### *Requirements for storage areas and containers*

No metal or light-weight-metal containers.

#### *Storage conditions*

Tightly closed.

Recommended storage temperature see product label.

### 7.3 Specific end use(s)

See exposure scenario in the Annex to this MSDS.

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## SECTION 8. Exposure controls/personal protection

### 8.1 Control parameters

#### **Derived No Effect Level (DNEL)**

#### *ammonia solution (1336-21-6)*

Worker DNEL, acute	Systemic effects	dermal	6,8 mg/kg Body weight
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Worker DNEL, longterm	Systemic effects	dermal	6,8 mg/kg Body weight
Worker DNEL, acute	Systemic effects	inhalation	47,6 mg/m <sup>3</sup>
Worker DNEL, acute	Local effects	inhalation	36 mg/m <sup>3</sup>
Worker DNEL, longterm	Systemic effects	inhalation	47,6 mg/m <sup>3</sup>
Worker DNEL, longterm	Local effects	inhalation	14 mg/m <sup>3</sup>
Consumer DNEL, acute	Systemic effects	dermal	68 mg/kg Body weight
Consumer DNEL, longterm	Systemic effects	dermal	68 mg/kg Body weight
Consumer DNEL, acute	Systemic effects	inhalation	23,8 mg/m <sup>3</sup>
Consumer DNEL, acute	Local effects	inhalation	7,2 mg/m <sup>3</sup>
Consumer DNEL, longterm	Systemic effects	inhalation	23,8 mg/m <sup>3</sup>
Consumer DNEL, longterm	Local effects	inhalation	2,8 mg/m <sup>3</sup>
Consumer DNEL, acute	Systemic effects	oral	6,8 mg/kg Body weight
Consumer DNEL, longterm	Systemic effects	oral	6,8 mg/kg Body weight

## Predicted No Effect Concentration (PNEC)

*ammonia solution (1336-21-6)*

PNEC Fresh water	0,0011 mg/l
PNEC Aquatic intermittent release	0,0068 mg/l
PNEC Marine water	0,00011 mg/l

## 8.2 Exposure controls

### Engineering measures

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

See section 7.1.

## Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

### *Eye/face protection*

Tightly fitting safety goggles

### *Hand protection*

full contact:

Glove material:	butyl-rubber
Glove thickness:	0,7 mm
Break through time:	> 480 min

splash contact:

Glove material:	Nitrile rubber
Glove thickness:	0,40 mm
Break through time:	> 240 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 898 Butoject® (full contact), KCL 730 Camatril® -Velours (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet(>,<) supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

### *Other protective equipment*

protective clothing



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## *Respiratory protection*

required when vapours/aerosols are generated.

Recommended Filter type: Filter K (acc. to DIN 3181) for NH<sub>3</sub>

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

## **Environmental exposure controls**

Do not empty into drains.

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## **SECTION 9. Physical and chemical properties**

### **9.1 Information on basic physical and chemical properties**

Form	liquid
Colour	colourless
Odour	stinging
Odour Threshold	0,02 - 70,7 ppm Ammonia
pH	at 20 °C strongly alkaline
Melting point	-57,5 °C
Boiling point/boiling range	37,7 °C at 1.013 hPa
Flash point	No information available.
Evaporation rate	No information available.

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Flammability (solid, gas)	No information available.
Lower explosion limit	15,4 %(V)
Upper explosion limit	33,6 %(V)
Vapour pressure	483 hPa at 20 °C
Relative vapour density	No information available.
Density	0,903 g/cm <sup>3</sup> at 20 °C
Relative density	No information available.
Water solubility	at 20 °C soluble
Partition coefficient: n-octanol/water	log Pow: -1,38 (experimental) (anhydrous substance) (Lit.) Bioaccumulation is not expected.
Auto-ignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	No information available.
Explosive properties	Not classified as explosive.
Oxidizing properties	none

## 9.2 Other data

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Minimum ignition energy 380 - 680 mJ

Corrosion May be corrosive to metals.

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## SECTION 10. Stability and reactivity

### 10.1 Reactivity

See section 10.3

### 10.2 Chemical stability

Ammonia solution itself is not flammable, but can form an ignitable ammonia/air-mixture by outgassing.

### 10.3 Possibility of hazardous reactions

A risk of explosion and/or of toxic gas formation exists with the following substances:

Oxidizing agents, Mercury, Oxygen, silver compounds, nitrogen trichloride, hydrogen peroxide, silver, antimony hydride, halogens, Acids, Calcium, Chlorine, Chlorites, auric salts, perchlorates, sodium hypochlorite, mercury compounds, halogen oxides

Heavy metals, Heavy metal salts, Acid chlorides, Acid anhydrides

Risk of ignition or formation of inflammable gases or vapours with:

Boranes, Boron, Oxides of phosphorus, Nitric acid, silicon compounds, chromium(VI) oxide, chromyl chloride

Exothermic reaction with:

Acetaldehyde, Acrolein, Barium, boron compounds, Bromine, halogen-halogen compounds, hydrogen bromide, silane, Hydrogen chloride gas, halogen compounds, dimethylsulfate, nitrogen oxides, Fluorine, Hydrogen fluoride, chlorates, carbon dioxide

Ethylene oxide, polymerisable

### 10.4 Conditions to avoid

Heating.

### 10.5 Incompatible materials

Aluminium, Lead, Nickel, silver, Zinc, Copper, metal alloys, various metals

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## 10.6 Hazardous decomposition products

in the event of fire: See section 5.

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## SECTION 11. Toxicological information

### 11.1 Information on toxicological effects

#### Mixture

##### *Acute oral toxicity*

LDLO human: 43 mg/kg

(29% solution) (RTECS)

Symptoms: gastric pain, Bloody vomiting, If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

##### *Acute inhalation toxicity*

Symptoms: mucosal irritations, Cough, Shortness of breath, bronchitis, Possible damages:, damage of respiratory tract

##### *Acute dermal toxicity*

This information is not available.

##### *Skin irritation*

Rabbit

Result: Severe irritations

(29% solution) (RTECS)

Dermatitis Necrosis

Mixture causes burns.

##### *Eye irritation*

Rabbit

Result: Severe irritations

(29% solution) (RTECS)

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Mixture causes serious eye damage. Risk of blindness!

### *Sensitisation*

This information is not available.

### *Germ cell mutagenicity*

This information is not available.

### *Carcinogenicity*

This information is not available.

### *Reproductive toxicity*

This information is not available.

### *Teratogenicity*

This information is not available.

### *Specific target organ toxicity - single exposure*

Mixture may cause respiratory irritation.

Target Organs: Respiratory system

### *Specific target organ toxicity - repeated exposure*

This information is not available.

### *Aspiration hazard*

This information is not available.

## 11.2 Further information

Systemic effects:

Nausea, collapse, shock, Unconsciousness, Convulsions

Lung oedema, Possible effects:

death

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

## Components

*ammonia solution*

No information available.

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## SECTION 12. Ecological information

### Mixture

#### 12.1 Toxicity

No information available.

#### 12.2 Persistence and degradability

##### *Biodegradability*

Not readily biodegradable.

#### 12.3 Bioaccumulative potential

##### *Partition coefficient: n-octanol/water*

log Pow: -1,38

(experimental)

(anhydrous substance) (Lit.) Bioaccumulation is not expected.

#### 12.4 Mobility in soil

No information available.

#### 12.5 Results of PBT and vPvB assessment

Substance(s) in the mixture do(es) not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII, or a PBT/vPvB assessment was not conducted.

#### 12.6 Other adverse effects

##### *Additional ecological information*

Biological effects:

Harmful effect due to pH shift.

Forms toxic and corrosive mixtures with water even if diluted.

Discharge into the environment must be avoided.

### Components

*ammonia solution*

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

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## SECTION 13. Disposal considerations

### *Waste treatment methods*

See [www.retrologistik.com](http://www.retrologistik.com) for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

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## SECTION 14. Transport information

### Land transport (ADR/RID)

14.1 UN number	UN 2672
14.2 Proper shipping name	AMMONIA SOLUTION
14.3 Class	8
14.4 Packing group	III
14.5 Environmentally hazardous	yes
14.6 Special precautions for user	yes
Tunnel restriction code	E

### Inland waterway transport (ADN)

Not relevant

### Air transport (IATA)

14.1 UN number	UN 2672
14.2 Proper shipping name	AMMONIA SOLUTION
14.3 Class	8
14.4 Packing group	III
14.5 Environmentally hazardous	yes
14.6 Special precautions for user	no

### Sea transport (IMDG)

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**14.1 UN number** UN 2672  
**14.2 Proper shipping name** AMMONIA SOLUTION  
**14.3 Class** 8  
**14.4 Packing group** III  
**14.5 Environmentally hazardous** yes  
**14.6 Special precautions for user** yes  
**EmS** F-A S-B  
**14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**  
Not relevant

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## SECTION 15. Regulatory information

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

#### *EU regulations*

Major Accident Hazard SEVESO III  
Legislation ENVIRONMENTAL HAZARDS  
E1  
Quantity 1: 100 t  
Quantity 2: 200 t  
Occupational restrictions Take note of Dir 94/33/EC on the protection of young people at work.

Regulation (EC) No 1005/2009 on substances that not regulated  
deplete the ozone layer

Regulation (EC) No 850/2004 of the European not regulated  
Parliament and of the Council of 29 April 2004 on  
persistent organic pollutants and amending  
Directive 79/117/EEC



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Substances of very high concern (SVHC)

This product does not contain substances of very high concern according to Regulation (EC) No 1907/2006 (REACH), Article 57 above the respective regulatory concentration limit of  $\geq 0.1\%$  (w/w).

### *National legislation*

Storage class 8B

## 15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

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## SECTION 16. Other information

### Full text of H-Statements referred to under sections 2 and 3.

H290 May be corrosive to metals.  
H314 Causes severe skin burns and eye damage.  
H335 May cause respiratory irritation.  
H400 Very toxic to aquatic life.

### Training advice

Provide adequate information, instruction and training for operators.

### Labelling

#### *Hazard pictograms*



#### *Signal word*

Danger

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## *Hazard statements*

H290 May be corrosive to metals.  
H314 Causes severe skin burns and eye damage.  
H335 May cause respiratory irritation.  
H400 Very toxic to aquatic life.

## *Precautionary statements*

### Prevention

P273 Avoid release to the environment.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

### Response

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
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 or doctor/ physician.

## **Key or legend to abbreviations and acronyms used in the safety data sheet**

Used abbreviations and acronyms can be looked up at [www.wikipedia.org](http://www.wikipedia.org).

## **Regional representation**

This information is given on the authorised Safety Data Sheet for your country.

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*The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.*

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## EXPOSURE SCENARIO 1 (Industrial use)

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### 1. Industrial use Reagent for analysis, Chemical production)

#### Sectors of end-use

- SU 3* Industrial uses: Uses of substances as such or in preparations at industrial sites  
*SU 9* Manufacture of fine chemicals  
*SU 10* Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)

#### Chemical product category

- PC19* Intermediate  
*PC21* Laboratory chemicals

#### Process categories

- PROC1* Use in closed process, no likelihood of exposure  
*PROC2* Use in closed, continuous process with occasional controlled exposure  
*PROC3* Use in closed batch process (synthesis or formulation)  
*PROC4* Use in batch and other process (synthesis) where opportunity for exposure arises  
*PROC5* Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)  
*PROC8a* Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities  
*PROC8b* Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities  
*PROC9* Transfer of substance or preparation into small containers (dedicated filling line, including weighing)  
*PROC10* Roller application or brushing  
*PROC15* Use as laboratory reagent

#### Environmental Release Categories

- ERC2* Formulation of preparations  
*ERC4* Industrial use of processing aids in processes and products, not becoming part of articles  
*ERC6a* Industrial use resulting in manufacture of another substance (use of intermediates)  
*ERC6b* Industrial use of reactive processing aids  
*ERC7* Industrial use of substances in closed systems

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## 2. Contributing scenarios: Operational conditions and risk management measures

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### Amount used

Daily amount per site (Msafe) 3.030 t

#### Environment factors not influenced by risk management

Dilution Factor (River) 10  
Dilution Factor (Coastal Areas) 10

#### Other given operational conditions affecting environmental exposure

Number of emission days per year 330  
Emission or Release Factor: Water 0 %

#### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant Municipal sewage treatment plant  
Flow rate of sewage treatment 2.000 m3/d  
plant effluent  
Sludge Treatment Can be landfilled or incinerated, when in compliance with local regulations.

#### Conditions and measures related to external treatment of waste for disposal

Waste treatment All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.  
Disposal methods Effectiveness (of a measure): 100 %

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### 2.2 Contributing scenario controlling environmental exposure for: ERC4

#### Amount used

Daily amount per site (Msafe) 757.575,7 kg

#### Environment factors not influenced by risk management

Dilution Factor (River) 10

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## Other given operational conditions affecting environmental exposure

Number of emission days per year 330  
Emission or Release Factor: Water 0 %

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant Municipal sewage treatment plant  
Flow rate of sewage treatment 2.000 m3/d  
plant effluent  
Sludge Treatment Can be landfilled or incinerated, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Waste treatment All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.  
Disposal methods Effectiveness (of a measure): 100 %

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## 2.3 Contributing scenario controlling environmental exposure for: ERC6a

### Amount used

Daily amount per site (Msafe) 2.424.242 kg

### Environment factors not influenced by risk management

Dilution Factor (River) 10  
Dilution Factor (Coastal Areas) 10

## Other given operational conditions affecting environmental exposure

Number of emission days per year 330  
Emission or Release Factor: Water 0 %

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant Municipal sewage treatment plant  
Flow rate of sewage treatment 2.000 m3/d  
plant effluent  
Sludge Treatment Can be landfilled or incinerated, when in compliance with local

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regulations.

## Conditions and measures related to external treatment of waste for disposal

Waste treatment	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Disposal methods	Effectiveness (of a measure): 100 %

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## 2.4 Contributing scenario controlling environmental exposure for: ERC6b

### Amount used

Daily amount per site (Msafe)	75.757 kg
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### Environment factors not influenced by risk management

Dilution Factor (River)	10
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### Other given operational conditions affecting environmental exposure

Number of emission days per year	330
Emission or Release Factor: Water	0 %

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	2.000 m3/d
Sludge Treatment	Can be landfilled or incinerated, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Waste treatment	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Disposal methods	Effectiveness (of a measure): 100 %

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## 2.5 Contributing scenario controlling environmental exposure for: ERC7

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## Amount used

Daily amount per site (Msafe) 75.757,5 kg

## Environment factors not influenced by risk management

Dilution Factor (River) 10

## Other given operational conditions affecting environmental exposure

Number of emission days per year 330

Emission or Release Factor: Water 0 %

## Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant Municipal sewage treatment plant

Flow rate of sewage treatment 2.000 m3/d

plant effluent

Sludge Treatment Can be landfilled or incinerated, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Waste treatment All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

Disposal methods Effectiveness (of a measure): 100 %

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## 2.6 Contributing scenario controlling worker exposure for: PROC1, PROC2

### Product characteristics

Concentration of the Substance in Mixture/Article Covers the percentage of the substance in the product up to 40 %.

Physical Form (at time of use) High volatile liquid

### Frequency and duration of use

Frequency of use 8 hours/day

Frequency of use 5 days/week

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## Other operational conditions affecting workers exposure

Outdoor / Indoor Indoor without local exhaust ventilation (LEV)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Tightly fitting safety goggles

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## 2.7 Contributing scenario controlling worker exposure for: PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC15

### Product characteristics

Concentration of the Substance in Mixture/Article Covers the percentage of the substance in the product up to 40 %.  
Physical Form (at time of use) High volatile liquid

### Frequency and duration of use

Frequency of use 8 hours/day  
Frequency of use 5 days/week

## Other operational conditions affecting workers exposure

Outdoor / Indoor Indoor with local exhaust ventilation (LEV)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Tightly fitting safety goggles

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## 3. Exposure estimation and reference to its source



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## Environment

CS	Use descriptor	Msafe	Compartment	RCR	Exposure Assessment Method
2.1	ERC2	3030 t/day	Fresh water	1	EUSES
2.2	ERC4	757 t/day	Fresh water	1	EUSES
2.3	ERC6a	2424 t/day	Fresh water	1	EUSES
2.4	ERC6b	75 t/day	Marine water	1	EUSES
2.5	ERC7	75,75 t/day	Fresh water	1	EUSES

## Workers

CS	Use descriptor	Exposure duration, route, effect	RCR	Exposure Assessment Method
2.6	PROC1	longterm, inhalative, systemic	< 0,01	ECETOC TRA 3
		longterm, dermal, systemic	< 0,01	ECETOC TRA 3
		longterm, combined, systemic	< 0,01	
		longterm, inhalative, local	< 0,01	ECETOC TRA 3
2.6	PROC2	longterm, inhalative, systemic	0,15	ECETOC TRA 3
		longterm, dermal, systemic	< 0,01	ECETOC TRA 3
		longterm, combined, systemic	0,16	
		longterm, inhalative, local	0,5	ECETOC TRA 3

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2.7	PROC3	longterm, inhalative, systemic	0,03	ECETOC TRA 3
		longterm, dermal, systemic	< 0,01	ECETOC TRA 3
		longterm, combined, systemic	0,03	
		longterm, inhalative, local	0,1	ECETOC TRA 3
2.7	PROC4	longterm, inhalative, systemic	0,06	ECETOC TRA 3
		longterm, dermal, systemic	0,04	ECETOC TRA 3
		longterm, combined, systemic	0,1	
		longterm, inhalative, local	0,2	ECETOC TRA 3
2.7	PROC5	longterm, inhalative, systemic	0,15	ECETOC TRA 3
		longterm, dermal, systemic	0,08	ECETOC TRA 3
		longterm, combined, systemic	0,23	
		longterm, inhalative, local	0,51	ECETOC TRA 3
2.7	PROC8a	longterm, inhalative, systemic	0,15	ECETOC TRA 3
		longterm, dermal, systemic	0,08	ECETOC TRA 3
		longterm, combined, systemic	0,23	
		longterm, inhalative, local	0,51	ECETOC TRA 3
2.7	PROC8b	longterm, inhalative, systemic	0,04	ECETOC TRA 3
		longterm, dermal, systemic	0,08	ECETOC TRA 3
		longterm, combined, systemic	0,13	
		longterm, inhalative, local	0,15	ECETOC TRA 3
2.7	PROC9	longterm, inhalative, systemic	0,12	ECETOC TRA 3
		longterm, dermal, systemic	0,04	ECETOC TRA 3
		longterm, combined, systemic	0,16	
		longterm, inhalative, local	0,4	ECETOC TRA 3
2.7	PROC10	longterm, inhalative, systemic	0,15	ECETOC TRA 3
		longterm, dermal, systemic	0,16	ECETOC TRA 3
		longterm, combined, systemic	0,31	
		longterm, inhalative, local	0,51	ECETOC TRA 3
2.7	PROC15	longterm, inhalative, systemic	0,03	ECETOC TRA 3
		longterm, dermal, systemic	< 0,01	ECETOC TRA 3
		longterm, combined, systemic	0,03	
		longterm, inhalative, local	0,1	ECETOC TRA 3

The default parameters and -efficiencies of the applied exposure assessment model were used for the calculation (unless stated differently).

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## 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Chapter R.12: Use descriptor system; ECHA Guidance for downstream users; ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

For scaling of worker exposure assessments performed with ECETOC TRA, please consult the Merck tool SciDeEx® at [www.merckmillipore.com/scideex](http://www.merckmillipore.com/scideex).

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## EXPOSURE SCENARIO 2 (Professional use)

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### 1. Professional use Reagent for analysis, Chemical production)

#### Sectors of end-use

*SU 22* Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

#### Chemical product category

*PC 21* Laboratory chemicals

#### Process categories

*PROC 15* Use as laboratory reagent

#### Environmental Release Categories

*ERC 2* Formulation of preparations

*ERC 6a* Industrial use resulting in manufacture of another substance (use of intermediates)

*ERC 6b* Industrial use of reactive processing aids

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### 2. Contributing scenarios: Operational conditions and risk management measures

#### 2.1 Contributing scenario controlling environmental exposure for: ERC2

##### Amount used

Daily amount per site (Msafe) 3.030 t

##### Environment factors not influenced by risk management

Dilution Factor (River) 10

Dilution Factor (Coastal Areas) 10

##### Other given operational conditions affecting environmental exposure

Number of emission days per year 330

Emission or Release Factor: Water 0 %

##### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant Municipal sewage treatment plant

Flow rate of sewage treatment 2.000 m3/d

plant effluent

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Sludge Treatment Can be landfilled or incinerated, when in compliance with local regulations.

## Conditions and measures related to external treatment of waste for disposal

Waste treatment All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

Disposal methods Effectiveness (of a measure): 100 %

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## 2.2 Contributing scenario controlling environmental exposure for: ERC6a

### Amount used

Daily amount per site (Msafe) 2.424.242 kg

### Environment factors not influenced by risk management

Dilution Factor (River) 10  
Dilution Factor (Coastal Areas) 10

### Other given operational conditions affecting environmental exposure

Number of emission days per year 330  
Emission or Release Factor: Water 0 %

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant Municipal sewage treatment plant  
Flow rate of sewage treatment 2.000 m3/d  
plant effluent  
Sludge Treatment Can be landfilled or incinerated, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Waste treatment All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.

Disposal methods Effectiveness (of a measure): 100 %

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## 2.3 Contributing scenario controlling environmental exposure for: ERC6b

### Amount used

Daily amount per site (Msafe)	75.757 kg
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### Environment factors not influenced by risk management

Dilution Factor (River)	10
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### Other given operational conditions affecting environmental exposure

Number of emission days per year	330
Emission or Release Factor: Water	0 %

### Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant	Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	2.000 m3/d
Sludge Treatment	Can be landfilled or incinerated, when in compliance with local regulations.

### Conditions and measures related to external treatment of waste for disposal

Waste treatment	All contaminated waste water must be processed in an industrial or municipal wastewater treatment plant that incorporates both primary and secondary treatments.
Disposal methods	Effectiveness (of a measure): 100 %

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## 2.4 Contributing scenario controlling worker exposure for: PROC15

### Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 40 %.
Physical Form (at time of use)	High volatile liquid

### Frequency and duration of use

Frequency of use	8 hours/day
Frequency of use	5 days/week

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## Other operational conditions affecting workers exposure

Outdoor / Indoor Indoor with local exhaust ventilation (LEV)

## Conditions and measures related to personal protection, hygiene and health evaluation

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. Tightly fitting safety goggles

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## 3. Exposure estimation and reference to its source

### Environment

CS	Use descriptor	Msafe	Compartment	RCR	Exposure Assessment Method
2.1	ERC2	3030 t/day	Fresh water	1	EUSES
2.2	ERC6a	2424 t/day	Fresh water	1	EUSES
2.3	ERC6b	75 t/day	Marine water	1	EUSES

### Workers

CS	Use descriptor	Exposure duration, route, effect	RCR	Exposure Assessment Method
2.4	PROC15	longterm, inhalative, systemic	0,06	ECETOC TRA 3
		longterm, dermal, systemic	< 0,01	ECETOC TRA 3
		longterm, combined, systemic	0,06	
		longterm, inhalative, local	0,2	ECETOC TRA 3

The default parameters and -efficiencies of the applied exposure assessment model were used for the calculation (unless stated differently).

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## 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Chapter R.12: Use descriptor system; ECHA Guidance for downstream users; ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH

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Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC  
Guidance Specific Environmental Release Categories (SPERCs).

For scaling of worker exposure assessments performed with ECETOC TRA, please consult the Merck  
tool SciDeEx® at [www.merckmillipore.com/scideex](http://www.merckmillipore.com/scideex).