SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 13.03.2018 Version 18.3

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.

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

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.

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.

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
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.

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.

SECTION 5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

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

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.

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.
Observe possible material restrictions (see sections 7 and 10).
Take up with liquid-absorbent and neutralising material (e.g. Chemizorb® OH^-, Merck Art. No. 101596). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

Indications about waste treatment see section 13.

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.

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
Worker DNEL, longterm	Systemic effects	dermal	6,8 mg/kg Body weight
Worker DNEL, acute	Systemic effects	inhalation	47,6 mg/m³
Worker DNEL, acute	Local effects	inhalation	36 mg/m³
Worker DNEL, longterm	Systemic effects	inhalation	47,6 mg/m³
Worker DNEL, longterm	Local effects	inhalation	14 mg/m³
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/m³
Consumer DNEL, acute	Local effects	inhalation	7,2 mg/m³
Consumer DNEL, longterm	Systemic effects	inhalation	23,8 mg/m³
Consumer DNEL, longterm	Local effects	inhalation	2,8 mg/m³
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

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).

Other protective equipment
protective clothing

Respiratory protection
required when vapours/aerosols are generated.
Recommended Filter type: Filter K (acc. to DIN 3181) for NH_3
The entrepeneur 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.

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.
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/cm3 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

Minimum ignition energy	380 - 680 mJ
Corrosion	May be corrosive to metals.

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

10.6 Hazardous decomposition products

in the event of fire: See section 5.

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)

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.

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.

SECTION 13. Disposal considerations

Waste treatment methods

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

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)

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

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 deplete the ozone layer	not regulated

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

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

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.

Regional representation

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

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.

EXPOSURE SCENARIO 1 (Industrial use)

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
SU9	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

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 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 %

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

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 %

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 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 %

2.4 Contributing scenario controlling environmental exposure for: ERC6b

Amount used

Daily amount per site (Msafe)	75.757 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 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 %

2.5 Contributing scenario controlling environmental exposure for: ERC7

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 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 %

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

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

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

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	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

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).

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.

EXPOSURE SCENARIO 2 (Professional use)

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

PC21 Laboratory chemicals

Process categories

PROC15 Use as laboratory reagent

Environmental Release Categories

ERC2 Formulation of preparations

ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)

ERC6b Industrial use of reactive processing aids

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 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 %

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 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 %

2.3 Contributing scenario controlling environmental exposure for: ERC6b

Amount used

Daily amount per site (Msafe)	75.757 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 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 %

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

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

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).

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.