SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Revision Date 16.04.2019 Version 16.0

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

1.1 Product identifier

Catalogue No.	100845
Product name	Ethanolamine for analysis EMSURE®
REACH Registration Number	01-2119486455-28-XXXX
CAS-No.	141-43-5

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

Identified uses	Reagent for analysis 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)

Acute toxicity, Category 4, Oral, H302
Acute toxicity, Category 4, Inhalation, H332
Acute toxicity, Category 4, Dermal, H312
Skin corrosion, Category 1B, H314
Specific target organ toxicity - single exposure, Category 3, Respiratory system, H335
Long-term (chronic) aquatic hazard, Category 3, H412

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
H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled.
H314 Causes severe skin burns and eye damage.
H335 May cause respiratory irritation.
H412 Harmful to aquatic life with long lasting effects.

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.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
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.
H412 Harmful to aquatic life with long lasting effects.

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.

Index-No. 603-030-00-8

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

3.1 Substance

Formula	$NH_2CH_2CH_2OH$	C_2H_7NO (Hill)
Index-No.	603-030-00-8	
EC-No.	205-483-3	
Molar mass	61,08 g/mol	

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

Chemical name (Concentration)

CAS-No.	Registration number	Classification
ethanolamine (>= 80 % - <= 100 %)		

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

141-43-5	01-2119486455-28-XXXX	Acute toxicity, Category 4, H302 Acute toxicity, Category 4, H332 Acute toxicity, Category 4, H312 Skin corrosion, Category 1B, H314 Specific target organ toxicity - single exposure, Category 3, H335 Long-term (chronic) aquatic hazard, Category 3, H412

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

3.2 Mixture

Not applicable

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.

If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

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

bronchitis, Drowsiness, Nausea

Irritation and corrosion, Cough, Shortness of breath
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
Water, Foam, Carbon dioxide (CO2), Dry powder

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

5.2 Special hazards arising from the substance or mixture
Combustible.
Vapours are heavier than air and may spread along floors.
Forms explosive mixtures with air on intense heating.
Development of hazardous combustion gases or vapours possible in the event of fire.
Fire may cause evolution of:
nitrous gases, 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
Remove container from danger zone and cool with water. 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. Keep away from heat and sources of ignition. 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 let product enter 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.

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

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
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)

Worker DNEL, longterm	Systemic effects	dermal	1 mg/kg Body weight
Worker DNEL, longterm	Local effects	inhalation	3,3 mg/m³
Consumer DNEL, longterm	Systemic effects	dermal	0,24 mg/kg Body weight
Consumer DNEL, longterm	Local and systemic effects	inhalation	2 mg/m³
Consumer DNEL, longterm	Systemic effects	oral	3,75 mg/kg Body weight

Predicted No Effect Concentration (PNEC)

PNEC Fresh water	0,085 mg/l
PNEC Marine water	0,0085 mg/l
PNEC Aquatic intermittent release	0,025 mg/l
PNEC Sewage treatment plant	100 mg/l
PNEC Sediment	0,425 mg/kg
PNEC Marine sediment	0,0425 mg/kg
PNEC Soil	0,035 mg/kg

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:	natural latex
Glove thickness:	0,6 mm
Break through time:	> 480 min

splash contact:

Glove material:	Nitrile rubber
Glove thickness:	0,11 mm
Break through time:	> 10 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 706 Lapren® (full contact), KCL 741 Dermatril® L (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
Flame retardant antistatic protective clothing.

Respiratory protection
required when vapours/aerosols are generated.
Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds
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 let product enter drains.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	liquid
Colour	colourless
Odour	ammoniacal
Odour Threshold	No information available.
pH	12,1 at 100 g/l 20 °C
Melting point	10,5 °C
Boiling point/boiling range	171 °C at 1.013 hPa
Flash point	92,5 °C Method: DIN 51758
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.

Lower explosion limit	3,4 %(V)
Upper explosion limit	27 %(V)
Vapour pressure	0,5 hPa at 20 °C
Relative vapour density	2,1
Density	1,02 g/cm3 at 20 °C
Relative density	No information available.
Water solubility	at 20 °C soluble
Partition coefficient: n-octanol/water	log Pow: -1,91 (25 °C) OECD Test Guideline 107 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

Ignition temperature	410 °C Method: DIN 51794
Viscosity, kinematic	20 mm2/s at 23 °C

SECTION 10. Stability and reactivity

10.1 Reactivity

Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

10.2 Chemical stability

Sensitive to air.
hygroscopic

10.3 Possibility of hazardous reactions

Exothermic reaction with:

Acrolein, Nitriles, chlorosulfonic acid, Hydrogen chloride gas, acetic acid, Acetic anhydride, fuming sulfuric acid, Nitric acid, sulphuric acid, mineral acids, vinyl acetate, Oxidizing agents

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

sulfur, iron(III) compounds

Caution! In contact with nitrites, nitrates, nitrous acid possible liberation of nitrosamines!

10.4 Conditions to avoid
Strong heating.

10.5 Incompatible materials
rubber, Copper, Copper alloys

10.6 Hazardous decomposition products
in the event of fire: See section 5.

SECTION 11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity
LD50 Rat: ca. 1.515 mg/kg
OECD Test Guideline 401

Symptoms: 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
Acute toxicity estimate: 11,1 mg/l; vapour
Expert judgement

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

Acute dermal toxicity
LD50 Rabbit: 2.692,5 mg/kg
OECD Test Guideline 402

Skin irritation
Rabbit
Result: Corrosive
OECD Test Guideline 404
Causes burns.

Eye irritation
Rabbit
Result: Corrosive
OECD Test Guideline 405

Causes serious eye damage.
Risk of blindness!

Sensitisation
Maximisation Test Guinea pig
Result: negative

(ECHA)

Germ cell mutagenicity
Genotoxicity in vivo
In vivo micronucleus test
Mouse
male and female
Oral
Bone marrow
Result: negative
Method: OECD Test Guideline 474

Genotoxicity in vitro
Ames test
Escherichia coli/Salmonella typhimurium
Result: negative
Method: OECD Test Guideline 471

Mutagenicity (mammal cell test): chromosome aberration.
rat hepatocytes
Result: negative
Method: OECD Test Guideline 473

In vitro mammalian cell gene mutation test
Mouse lymphoma test
Result: negative
Method: OECD Test Guideline 476

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
May cause respiratory irritation.

Specific target organ toxicity - repeated exposure
This information is not available.

Aspiration hazard
This information is not available.

11.2 Further information
After absorption:
Nausea, Drowsiness
Damage to:
Kidney, Liver

Under given conditions, contact with nitrites or nitric acid can lead to the formation of nitrosamines, which have shown themselves to be carcinogenic in animal experiments.
Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

12.1 Toxicity

Toxicity to fish
semi-static test LC50 Cyprinus carpio (Carp): 349 mg/l; 96 h
Analytical monitoring: yes
Directive 67/548/EEC, Annex V, C.1.

Toxicity to daphnia and other aquatic invertebrates
static test EC50 Daphnia magna (Water flea): 65 mg/l; 48 h
Analytical monitoring: yes
Directive 67/548/EEC, Annex V, C.2.

Toxicity to algae
static test ErC50 Pseudokirchneriella subcapitata (green algae): 2,8 mg/l; 72 h
Analytical monitoring: yes
OECD Test Guideline 201

static test NOEC Pseudokirchneriella subcapitata (green algae): 1 mg/l; 72 h
Analytical monitoring: yes
OECD Test Guideline 201

Toxicity to bacteria
EC50 activated sludge: > 1.000 mg/l; 3 h
OECD Test Guideline 209

Toxicity to fish (Chronic toxicity)
flow-through test NOEC Oryzias latipes (Orange-red killifish): 1,24 mg/l; 41 d

Analytical monitoring: yes
OECD Test Guideline 210

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)
semi-static test NOEC Daphnia magna (Water flea): 0,85 mg/l; 21 d
Analytical monitoring: yes

OECD Test Guideline 202

12.2 Persistence and degradability

Biodegradability
> 90 %; 21 d; aerobic
OECD Test Guideline 301A
Readily biodegradable

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water
log Pow: -1,91 (25 °C)
OECD Test Guideline 107

Bioaccumulation is not expected.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

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

12.6 Other adverse effects

Additional ecological information

Biological effects:
Harmful effect due to pH shift.
When discharged properly, no impairments in the function of adapted biological wastewater treatment plants are to be expected.
Discharge into the environment must be avoided.

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 2491
14.2 Proper shipping name	ETHANOLAMINE
14.3 Class	8
14.4 Packing group	III
14.5 Environmentally hazardous	--
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 2491
14.2 Proper shipping name	ETHANOLAMINE
14.3 Class	8
14.4 Packing group	III
14.5 Environmentally hazardous	--
14.6 Special precautions for user	no

Sea transport (IMDG)

14.1 UN number	UN 2491
14.2 Proper shipping name	ETHANOLAMINE
14.3 Class	8
14.4 Packing group	III
14.5 Environmentally hazardous	--
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	Not applicable
Occupational restrictions	Take note of Dir 94/33/EC on the protection of young people at work. Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.
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	8A

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.

H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H412	Harmful to aquatic life with long lasting effects.

Training advice
Provide adequate information, instruction and training for operators.

Labelling
Hazard pictograms

Signal word
Danger

Hazard statements
H227 Combustible liquid.
H302 + H312 + H332 Harmful if swallowed, in contact with skin or if inhaled.
H314 Causes severe skin burns and eye damage.
H335 May cause respiratory irritation.
H412 Harmful to aquatic life with long lasting effects.

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.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
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.

Relevant changes since previous version
2. Hazards identification
11. Toxicological information

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)

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
PROC14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation
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)

2. Contributing scenarios: Operational conditions and risk management measures
2.1 Contributing scenario controlling environmental exposure for: ERC2, SpERC AISE 2

Amount used

Daily amount per site (Msafe)	61.639 kg

Environment factors not influenced by risk management

Flow rate	18.000 m3/d
Dilution Factor (River)	10

Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	220
Emission or Release Factor: Air	0,00 %
Emission or Release Factor: Water	0,01 %
Emission or Release Factor: Soil	0,00 %

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
Effectiveness (of a measure)	87 %
Sludge Treatment	Sewage sludge should not be applied to natural soils.

2.2 Contributing scenario controlling environmental exposure for: ERC4

Amount used

Daily amount per site (Msafe)	1.008 kg

Environment factors not influenced by risk management

Flow rate	18.000 m3/d
Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	220
Emission or Release Factor: Air	0,00 %
Emission or Release Factor: Water	0,00 %
Emission or Release Factor: Soil	0,01 %

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
Effectiveness (of a measure)	87 %
Sludge Treatment	Sewage sludge should not be applied to natural soils.

2.3 Contributing scenario controlling environmental exposure for: ERC6a

Amount used

Daily amount per site (Msafe)	73.899 kg

Environment factors not influenced by risk management

Flow rate	18.000 m3/d
Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	300
Emission or Release Factor: Air	0,00 %
Emission or Release Factor: Water	0,00 %
Emission or Release Factor: Soil	0,01 %

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
Effectiveness (of a measure)	87 %
Sludge Treatment	Sewage sludge should not be applied to natural soils.

2.4 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 100 % (unless stated differently).
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 53 °C

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 intensive management supervision controls. Tightly fitting safety goggles

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable coveralls to prevent exposure to the skin.

2.5 Contributing scenario controlling worker exposure for: PROC3

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 53 °C

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 intensive management supervision controls. Tightly fitting safety goggles

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable coveralls to prevent exposure to the skin.

2.6 Contributing scenario controlling worker exposure for: PROC4

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 2,5 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 53 °C

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 'basic' employee training. Tightly fitting safety goggles

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable coveralls to prevent exposure to the skin.

2.7 Contributing scenario controlling worker exposure for: PROC5, PROC8a, PROC9, PROC14, PROC15

Product characteristics

Concentration of the	Covers the percentage of the substance in the product

Substance in Mixture/Article	up to 100 % (unless stated differently).
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 53 °C

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 intensive management supervision controls. Tightly fitting safety goggles

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable coveralls to prevent exposure to the skin.

2.8 Contributing scenario controlling worker exposure for: PROC8b

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 53 °C

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 intensive management supervision controls. Tightly fitting safety goggles

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable coveralls to prevent exposure to the skin.

2.9 Contributing scenario controlling worker exposure for: PROC10

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 10 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 53 °C

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 intensive management supervision controls. Tightly fitting safety goggles

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable coveralls to prevent exposure to the skin.

3. Exposure estimation and reference to its source

Environment

CS	Use descriptor	Msafe	Compartment	RCR	Exposure Assessment Method
2.1	ERC2, SpERC AISE 2	61639 kg/day	Fresh water	< 1	ECETOC TRA, modified
2.2	ERC4	1008 kg/day	Fresh water	< 1	ECETOC TRA 2
2.3	ERC6a	73899 kg/day	Fresh water	< 1	ECETOC TRA 2

Workers

CS	Use descriptor	Exposure duration, route, effect	RCR	Exposure Assessment Method
2.4	PROC1	longterm, inhalative, systemic	0,01	ECETOC TRA, modified
		longterm, dermal, systemic	0,01	ECETOC TRA, modified
		longterm, combined, systemic	0,02	
2.4	PROC2	longterm, inhalative, systemic	0,77	ECETOC TRA, modified
		longterm, dermal, systemic	0,03	ECETOC TRA, modified
		longterm, combined, systemic	0,8	
2.5	PROC3	longterm, inhalative, systemic	0,23	ECETOC TRA, modified
		longterm, dermal, systemic	0,01	ECETOC TRA, modified
		longterm, combined, systemic	0,24	
2.6	PROC4	longterm, inhalative, systemic	0,1	ECETOC TRA, modified
		longterm, dermal, systemic	0,02	ECETOC TRA, modified
		longterm, combined, systemic	0,12	

2.7	PROC5	longterm, inhalative, systemic	0,39	ECETOC TRA, modified
		longterm, dermal, systemic	0,27	ECETOC TRA, modified
		longterm, combined, systemic	0,66	
2.7	PROC8a	longterm, inhalative, systemic	0,46	ECETOC TRA, modified
		longterm, dermal, systemic	0,27	ECETOC TRA, modified
		longterm, combined, systemic	0,73	
2.7	PROC9	longterm, inhalative, systemic	0,39	ECETOC TRA, modified
		longterm, dermal, systemic	0,14	ECETOC TRA, modified
		longterm, combined, systemic	0,53	
2.7	PROC14	longterm, inhalative, systemic	0,39	ECETOC TRA, modified
		longterm, dermal, systemic	0,07	ECETOC TRA, modified
		longterm, combined, systemic	0,46	
2.7	PROC15	longterm, inhalative, systemic	0,39	ECETOC TRA, modified
		longterm, dermal, systemic	0,01	ECETOC TRA, modified
		longterm, combined, systemic	0,40	
2.8	PROC8b	longterm, inhalative, systemic	0,39	ECETOC TRA, modified
		longterm, dermal, systemic	0,14	ECETOC TRA, modified
		longterm, combined, systemic	0,53	
2.9	PROC10	longterm, inhalative, systemic	0,77	ECETOC TRA, modified
		longterm, dermal, systemic	0,05	ECETOC TRA, modified
		longterm, combined, systemic	0,82	

Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.

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)

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)

2. Contributing scenarios: Operational conditions and risk management measures
2.1 Contributing scenario controlling environmental exposure for: ERC2, SpERC AISE 2

Amount used

Daily amount per site (Msafe)	61.639 kg

Environment factors not influenced by risk management

Flow rate	18.000 m3/d
Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	220
Emission or Release Factor: Air	0,00 %
Emission or Release Factor: Water	0,01 %
Emission or Release Factor: Soil	0,00 %

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
Effectiveness (of a measure)	87 %
Sludge Treatment	Sewage sludge should not be applied to natural soils.

2.2 Contributing scenario controlling environmental exposure for: ERC6a

Amount used

Daily amount per site (Msafe)	73.899 kg

Environment factors not influenced by risk management

Flow rate	18.000 m3/d
Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	300
Emission or Release Factor: Air	0,00 %
Emission or Release Factor: Water	0,00 %
Emission or Release Factor: Soil	0,01 %

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
Effectiveness (of a measure)	87 %
Sludge Treatment	Sewage sludge should not be applied to natural soils.

2.3 Contributing scenario controlling worker exposure for: PROC15

Product characteristics

Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 53 °C

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 intensive management supervision controls. Tightly fitting safety goggles

Additional good practice advice beyond the REACH Chemical Safety Assessment

Additional good practice advice	Wear suitable coveralls to prevent exposure to the skin.

3. Exposure estimation and reference to its source

Environment

CS	Use descriptor	Msafe	Compartment	RCR	Exposure Assessment Method
2.1	ERC2, SpERC AISE 2	61639 kg/day	Fresh water	< 1	ECETOC TRA, modified
2.2	ERC6a	73899 kg/day	Fresh water	< 1	ECETOC TRA 2

Workers

CS	Use descriptor	Exposure duration, route, effect	RCR	Exposure Assessment Method
2.3	PROC15	longterm, inhalative, systemic	0,23	ECETOC TRA, modified
		longterm, dermal, systemic	0,01	ECETOC TRA, modified
		longterm, combined, systemic	0,24	

Reduction factor for local exhaust ventilation (LEV) has not been used for the calculation of dermal exposure estimates.

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.

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