SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Revision Date 03.09.2018 Version 11.1

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

1.1 Product identifier

Catalogue No.	803116
Product name	Diethanolamine for synthesis
REACH Registration Number	01-2119488930-28-XXXX
CAS-No.	111-42-2

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

Identified uses	Chemical for synthesis 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
Skin irritation, Category 2, H315
Serious eye damage, Category 1, H318
Specific target organ toxicity - repeated exposure, Category 2, Oral, Kidney, Liver, Blood, H373
Chronic aquatic toxicity, 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 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H373 May cause damage to organs (Kidney, Liver, Blood) through prolonged or repeated exposure if swallowed.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention

P273 Avoid release to the environment.
P280 Wear eye protection.

Response

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.

P314 Get medical advice/ attention if you feel unwell.

Reduced labelling (≤125 ml)

Hazard pictograms

Signal word

Danger

Hazard statements

H318 Causes serious eye damage.

H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

P280 Wear eye protection.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Contains: Diethanolamine

Index-No. 603-071-00-1

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

3.1 Substance

Formula	$NH(CH_2CH_2OH)_2$	$C_4H_{11}NO_2$ (Hill)
Index-No.	603-071-00-1	
EC-No.	203-868-0	
Molar mass	105,14 g/mol	

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

Chemical name (Concentration)

CAS-No.	Registration number	Classification
Diethanolamine (<= 100 %)		
Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.		
111-42-2	01-2119488930-28-XXXX	Acute toxicity, Category 4, H302 Skin irritation, Category 2, H315 Serious eye damage, Category 1, H318 Specific target organ toxicity - repeated exposure, Category 2, H373 Chronic aquatic toxicity, 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

After inhalation: fresh air. Call in physician.

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

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

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

Irritation and corrosion

Risk of serious damage to eyes.

Cough, Nausea, Headache, Dizziness

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

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: Avoid inhalation of dusts. 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 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 dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

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

Storage conditions

Tightly closed. Dry.

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	inhalation	1 mg/m³
Worker DNEL, longterm	Systemic effects	dermal	0,13 mg/kg Body weight
Consumer DNEL, longterm	Systemic effects	inhalation	0,25 mg/m³
Consumer DNEL, longterm	Systemic effects	dermal	0,07 mg/kg Body weight
Consumer DNEL, longterm	Systemic effects	oral	0,06 mg/kg Body weight

Predicted No Effect Concentration (PNEC)

PNEC Fresh water	0,0022 mg/l
PNEC Marine water	0,00022 mg/l
PNEC Aquatic intermittent release	0,022 mg/l
PNEC Fresh water sediment	0,019 mg/kg
PNEC Marine sediment	0,0019 mg/kg
PNEC Soil	0,00108 mg/kg
PNEC Sewage treatment plant	100 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:	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:	30 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

protective clothing

Respiratory protection

required when dusts/vapours/aerosols are generated.
Recommended Filter type: Filter A-(P2)
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	solid
Colour	colourless
Odour	ammoniacal
Odour Threshold	0,27 ppm
pH	ca. 11 at 53 g/l 20 °C
Melting point	28 °C
Boiling point/boiling range	269 - 270 °C at 1.013 hPa
Flash point	176 °C Method: DIN 51758
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	2,1 %(V)
Upper explosion limit	10,6 %(V)
Vapour pressure	< 0,01 hPa at 25 °C

	0,6 hPa at 100 °C
Relative vapour density	3,6
Density	1,09 g/cm3 at 30 °C liquid
Relative density	No information available.
Water solubility	at 20 °C soluble
Partition coefficient: n-octanol/water	log Pow: -2,18 (25 °C) OECD Test Guideline 107 Bioaccumulation is not expected.
Auto-ignition temperature	No information available.
Decomposition temperature	> 270 °C
Viscosity, dynamic	ca.390 mPa.s at 30 °C
Explosive properties	Not classified as explosive.
Oxidizing properties	none

9.2 Other data

Ignition temperature	365 - 370 °C Method: DIN 51794

Viscosity, kinematic	357,2 mm2/s at 30 °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.

The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability

hygroscopic

Sensitivity to light

10.3 Possibility of hazardous reactions

Exothermic reaction with:

anhydrides, Oxidizing agents, acids, Isocyanates, Halogenated compounds, Peroxides, phenols, acid halides, strong reducing agents

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

10.4 Conditions to avoid

Exposure to moisture

Strong heating.

10.5 Incompatible materials

bronze, Copper, Copper alloys, brass, Zinc, zinc 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. 1.600 mg/kg

OECD Test Guideline 401

Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.

Acute inhalation toxicity

Symptoms: Possible damages:, mucosal irritations

Acute dermal toxicity

LD50 Rabbit: 8.328 mg/kg

(RTECS)

Skin irritation

Rabbit

Result: irritating

OECD Test Guideline 404

Causes skin irritation.

Eye irritation

Causes serious eye damage.

Rabbit

Result: Causes serious eye damage.

OECD Test Guideline 405

Sensitisation

Maximisation Test Guinea pig

Result: negative

Method: OECD Test Guideline 406

Germ cell mutagenicity

Genotoxicity in vivo

In vivo micronucleus test

Mouse

male and female

Dermal

Red blood cells (erythrocytes)

Result: negative

Method: OECD Test Guideline 474

Genotoxicity in vitro

Ames test

Salmonella typhimurium

Result: negative

(National Toxicology Program)

Mutagenicity (mammal cell test): chromosome aberration.

Result: negative

Method: OECD Test Guideline 473

Ames test

Escherichia coli/Salmonella typhimurium

Result: negative

Method: OECD Test Guideline 471

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

This information is not available.

Specific target organ toxicity - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Exposure routes: Ingestion

Target Organs: Kidney, Liver, Blood

Aspiration hazard

This information is not available.

11.2 Further information

Systemic effects:

Cough, Nausea, Headache, Dizziness

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

static test LC50 Pimephales promelas (fathead minnow): 1.460 mg/l; 96 h

Analytical monitoring: no

(IUCLID)

Toxicity to daphnia and other aquatic invertebrates

static test EC50 Ceriodaphnia dubia (water flea): 30,1 mg/l; 48 h

Analytical monitoring: no

(ECHA)

Toxicity to algae

static test ErC50 Pseudokirchneriella subcapitata (green algae): 9,7 mg/l; 96 h

US-EPA

Toxicity to bacteria

static test EC10 activated sludge: > 1.000 mg/l; 30 min

Analytical monitoring: no

OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

semi-static test NOEC Daphnia magna (Water flea): 0,78 mg/l; 21 d

Analytical monitoring: yes

(ECHA)

12.2 Persistence and degradability

Biodegradability

93 %; 28 d; aerobic

OECD Test Guideline 301F

Readily biodegradable

Biochemical Oxygen Demand (BOD)

885 mg/g (5 d)

(External MSDS)

Chemical Oxygen Demand (COD)

1.352 mg/g

(External MSDS)

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: -2,18 (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 - 14.6 Not classified as dangerous in the meaning of transport regulations.

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

Sea transport (IMDG)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

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 Legislation	SEVESO III 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	10 - 13

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.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H373	May cause damage to organs through prolonged or repeated exposure.
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

H302 Harmful if swallowed.

H315 Causes skin irritation.

H318 Causes serious eye damage.

H373 May cause damage to organs (Kidney, Liver, Blood) through prolonged or repeated exposure if swallowed.

H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention

P273 Avoid release to the environment.

P280 Wear eye protection.
Response
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.
P314 Get medical advice/ attention if you feel unwell.

Contains: Diethanolamine

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 Chemical for synthesis)

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
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)	150.000 kg

Environment factors not influenced by risk management

Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	365
Emission or Release Factor: Air	0 %
Emission or Release Factor: Water	0 %
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
Sludge Treatment	Can be landfilled, when in compliance with local regulations.

2.2 Contributing scenario controlling environmental exposure for: ERC6a

Amount used

Daily amount per site (Msafe)	69.000 kg

Environment factors not influenced by risk management

Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	365
Emission or Release Factor: Air	0 %
Emission or Release Factor: Water	0 %

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

2.3 Contributing scenario controlling environmental exposure for: ERC6b

Amount used

Daily amount per site (Msafe)	69.000 kg

Environment factors not influenced by risk management

Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	365
Emission or Release Factor: Air	0 %
Emission or Release Factor: Water	0 %
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
Sludge Treatment	Can be landfilled, when in compliance with local regulations.

2.4 Contributing scenario controlling worker exposure for: PROC1

Product characteristics

Concentration of the Substance in	Covers the percentage of the substance in the product up to

Mixture/Article	100 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 132 °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)

Organisational measures to prevent /limit releases, dispersion and exposure

Covers daily exposures up to 8 hours.

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.

2.5 Contributing scenario controlling worker exposure for: PROC2, PROC3, PROC4, PROC8b, PROC9, PROC15

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 132 °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 LEV and enhanced general ventilation

Organisational measures to prevent /limit releases, dispersion and exposure

Covers daily exposures up to 8 hours.

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

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: PROC5

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 132 °C

Frequency and duration of use

Frequency of use	< 4 hours/day
Frequency of use	5 days/week

Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with LEV and enhanced general ventilation

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out operation for more than 4 hours.

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

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: PROC8a

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 100 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 132 °C

Frequency and duration of use

Frequency of use	< 1 hours/day
Frequency of use	5 days/week

Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with LEV and enhanced general ventilation

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out operation for more than 1 hour.

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

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: PROC10

Product characteristics

Concentration of the Substance in Mixture/Article	Covers the percentage of the substance in the product up to 5%.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 132 °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 LEV and enhanced general ventilation

Organisational measures to prevent /limit releases, dispersion and exposure

Covers daily exposures up to 8 hours.

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	150 t/day	Water	1	ECETOC TRA 3
2.2	ERC6a	69 t/day	Water	1	ECETOC TRA 3
2.3	ERC6b	69 t/day	Water	1	ECETOC TRA 3

Workers

CS	Use descriptor	Exposure duration, route, effect	RCR	Exposure Assessment Method
2.4	PROC1	longterm, inhalative, systemic	0,04	ECETOC TRA 3
		longterm, dermal, systemic	0,05	ECETOC TRA 3
		longterm, combined, systemic	0,1	

2.5	PROC2	longterm, inhalative, systemic	0,13	ECETOC TRA 3
		longterm, dermal, systemic	0,05	ECETOC TRA 3
		longterm, combined, systemic	0,18	
2.5	PROC3	longterm, inhalative, systemic	0,39	ECETOC TRA 3
		longterm, dermal, systemic	0,03	ECETOC TRA 3
		longterm, combined, systemic	0,42	
2.5	PROC4	longterm, inhalative, systemic	0,66	ECETOC TRA 3
		longterm, dermal, systemic	0,26	ECETOC TRA 3
		longterm, combined, systemic	0,92	
2.5	PROC8b	longterm, inhalative, systemic	0,33	ECETOC TRA 3
		longterm, dermal, systemic	0,26	ECETOC TRA 3
		longterm, combined, systemic	0,59	
2.5	PROC9	longterm, inhalative, systemic	0,66	ECETOC TRA 3
		longterm, dermal, systemic	0,26	ECETOC TRA 3
		longterm, combined, systemic	0,92	
2.5	PROC15	longterm, inhalative, systemic	0,66	ECETOC TRA 3
		longterm, dermal, systemic	0,01	ECETOC TRA 3
		longterm, combined, systemic	0,67	
2.6	PROC5	longterm, inhalative, systemic	0,39	ECETOC TRA 3
		longterm, dermal, systemic	0,53	ECETOC TRA 3
		longterm, combined, systemic	0,92	
2.7	PROC8a	longterm, inhalative, systemic	0,26	ECETOC TRA 3
		longterm, dermal, systemic	0,53	ECETOC TRA 3
		longterm, combined, systemic	0,79	
2.8	PROC10	longterm, inhalative, systemic	0,26	ECETOC TRA 3
		longterm, dermal, systemic	0,42	ECETOC TRA 3
		longterm, combined, systemic	0,68	

The default parameters and -efficiencies of the applied exposure assessment model were used for the calculation (unless stated differently).
For (other) acute and local effects risk management measures are based on qualitative risk characterisation.

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 Chemical for synthesis)

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)	150.000 kg

Environment factors not influenced by risk management

Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	365
Emission or Release Factor: Air	0 %
Emission or Release Factor: Water	0 %
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
Sludge Treatment	Can be landfilled, when in compliance with local regulations.

2.2 Contributing scenario controlling environmental exposure for: ERC6a

Amount used

Daily amount per site (Msafe)	69.000 kg

Environment factors not influenced by risk management

Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	365
Emission or Release Factor: Air	0 %
Emission or Release Factor: Water	0 %
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
Sludge Treatment	Can be landfilled, when in compliance with local regulations.

2.3 Contributing scenario controlling environmental exposure for: ERC6b

Amount used

Daily amount per site (Msafe)	69.000 kg

Environment factors not influenced by risk management

Dilution Factor (River)	10
Dilution Factor (Coastal Areas)	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	365
Emission or Release Factor: Air	0 %
Emission or Release Factor: Water	0 %
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
Sludge Treatment	Can be landfilled, when in compliance with local regulations.

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 100 %.
Physical Form (at time of use)	Low volatile liquid
Process Temperature	< 132 °C

Frequency and duration of use

Frequency of use	< 1 hours/day
Frequency of use	5 days/week

Other operational conditions affecting workers exposure

Outdoor / Indoor	Indoor with LEV and good general ventilation

Organisational measures to prevent /limit releases, dispersion and exposure

Avoid carrying out operation for more than 1 hour.

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.

3. Exposure estimation and reference to its source

Environment

CS	Use descriptor	Msafe	Compartment	RCR	Exposure Assessment Method
2.1	ERC2	150 t/day	Water	1	ECETOC TRA 3
2.2	ERC6a	69 t/day	Water	1	ECETOC TRA 3
2.3	ERC6b	69 t/day	Water	1	ECETOC TRA 3

Workers

CS	Use descriptor	Exposure duration, route, effect	RCR	Exposure Assessment Method
2.4	PROC15	longterm, inhalative, systemic	0,61	ECETOC TRA 3
		longterm, dermal, systemic	0,05	ECETOC TRA 3
		longterm, combined, systemic	0,67	

The default parameters and -efficiencies of the applied exposure assessment model were used for the calculation (unless stated differently).
For (other) acute and local effects risk management measures are based on qualitative risk characterisation.

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.