

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 8.9
Revision Date 14.07.2021
Print Date 08.03.2022**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifiers**

Product name : 1-Methyl-2-pyrrolidone EMPLURA®

Product Number : 8.06072

Catalogue No. : 806072

Brand : Millipore

Index-No. : 606-021-00-7

REACH No. : 01-2119472430-46-XXXX

CAS-No. : 872-50-4

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

Identified uses : Chemical for synthesis

1.3 Details of the supplier of the safety data sheet

Company : Merck Life Science Limited
Vale Road
Arklow
CO WICKLOW
Y14 EK18
IRELAND

Telephone : +353 402-20300

E-mail address : TechnicalService@merckgroup.com

1.4 Emergency telephone

Emergency Phone # : +(353)-19014670 (CHEMTREC)

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008**

Skin irritation (Category 2), H315

Eye irritation (Category 2), H319

Reproductive toxicity (Category 1B), H360FD

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

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

2.2 Label elements**Labelling according Regulation (EC) No 1272/2008**

Pictogram



Signal word	Danger
Hazard statement(s)	
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H360FD	May damage fertility. May damage the unborn child.
Precautionary statement(s)	
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P302 + P352	IF ON SKIN: Wash with plenty of 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 + P313	IF exposed or concerned: Get medical advice/ attention.
Supplemental Hazard Statements	none

Restricted to professional users.

Reduced Labeling (<= 125 ml)

Pictogram



Signal word	Danger
Hazard statement(s)	
H360FD	May damage fertility. May damage the unborn child.
Precautionary statement(s)	
P202	Do not handle until all safety precautions have been read and understood.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
Supplemental Hazard Statements	none

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	: C ₅ H ₉ NO
Molecular weight	: 99.13 g/mol
CAS-No.	: 872-50-4
EC-No.	: 212-828-1
Index-No.	: 606-021-00-7

Component	Classification	Concentration
N-methyl-2-pyrrolidone Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)		
CAS-No.	872-50-4	Skin Irrit. 2; Eye Irrit. 2; <= 100 %

EC-No.	212-828-1	Repr. 1B; STOT SE 3; H315, H319, H360FD, H335	
Index-No.	606-021-00-7	Concentration limits: >= 10 %: STOT SE 3, H335;	

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

Show this material safety data sheet to the doctor in attendance.

If inhaled

After inhalation: fresh air. Call in physician.

In case of skin contact

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

In case of eye contact

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

If swallowed

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

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data 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

Carbon oxides

Nitrogen oxides (NOx)

Combustible.

Fire may cause evolution of:

nitrogen oxides, nitrous gases

Vapors 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.

5.3 Advice 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.

5.4 Further information

Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/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 vapors, 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. For personal protection 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 carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

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.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Protected from light. Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Recommended storage temperature see product label.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
N-methyl-2-pyrrolidone	872-50-4	TWA	10 ppm 40 mg/m3	Europe. COMMISSION DIRECTIVE 2009/161/EU establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC
	Remarks	Identifies the possibility of significant uptake through the skin Indicative		
		STEL	20 ppm 80 mg/m3	Europe. COMMISSION DIRECTIVE 2009/161/EU establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC
		Identifies the possibility of significant uptake through the skin Indicative		
		OELV - 8 hrs (TWA)	10 ppm 40 mg/m3	Ireland. List of Chemical Agents and Occupational Exposure Limit Values - Schedule 1
		Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body		
		OELV - 15 min (STEL)	20 ppm 80 mg/m3	Ireland. List of Chemical Agents and Occupational Exposure Limit Values - Schedule 1
		Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body		

Predicted No Effect Concentration (PNEC)

Compartment	Value
Water	5 mg/l
Sea water	0.025 mg/kg
Fresh water	0.25 mg/l
Onsite sewage treatment plant	10 mg/l
Soil	0.0701 mg/kg
Sea sediment	0.109 mg/kg
Fresh water sediment	1.09 mg/kg

8.2 Exposure controls

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection

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).

Full contact

Material: butyl-rubber

Minimum layer thickness: 0.7 mm

Break through time: 480 min

Material tested: Butoject® (KCL 898)

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).

Splash contact

Material: Latex gloves

Minimum layer thickness: 0.6 mm

Break through time: 60 min

Material tested: Lapren® (KCL 706 / Aldrich Z677558, Size M)

Body Protection

protective clothing

Respiratory protection

Recommended Filter type: Filter A-(P2)

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

Control of environmental exposure

Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- | | |
|-------------------|----------------------------------|
| a) Appearance | Form: liquid
Color: colorless |
| b) Odor | amine-like |
| c) Odor Threshold | No data available |
| d) pH | 8.5 - 10.0 at 100 g/l at 20 °C |

e) Melting point/freezing point	Melting point: -24.2 °C at 1,013 hPa - OECD Test Guideline 102
f) Initial boiling point and boiling range	202 °C at 1,013.25 hPa
g) Flash point	91 °C - Pensky-Martens closed cup - ISO 2719
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available
j) Upper/lower flammability or explosive limits	Upper explosion limit: 9.5 %(V) Lower explosion limit: 1.3 %(V)
k) Vapor pressure	0.32 hPa at 20 °C - OECD Test Guideline 104
l) Vapor density	3.42 - (Air = 1.0)
m) Density	1.03 g/cm ³ at 25 °C - OECD Test Guideline 109
Relative density	No data available
n) Water solubility	1,000 g/l at 20 °C - soluble
o) Partition coefficient: n-octanol/water	log Pow: -0.46 at 25 °C - OECD Test Guideline 107 - Bioaccumulation is not expected.
p) Autoignition temperature	245 °C at 1,013 hPa - DIN 51794
q) Decomposition temperature	No data available
r) Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: 1.661 mPa.s at 25 °C
s) Explosive properties	No data available
t) Oxidizing properties	No data available

9.2 Other safety information

Conductivity	0.2 - 0.4 µS/cm
Surface tension	40.4 mN/m
Relative vapor density	3.42 - (Air = 1.0)

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

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Risk of ignition or formation of inflammable gases or vapours with:
Oxidizing agents
Violent reactions possible with:
Strong acids
Strong bases

10.4 Conditions to avoid

Strong heating.

10.5 Incompatible materials

various plastics

10.6 Hazardous decomposition products

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - male and female - 4,150 mg/kg

(OECD Test Guideline 401)

LC50 Inhalation - Rat - male and female - 4 h - > 5.1 mg/l

(OECD Test Guideline 403)

LD50 Dermal - Rat - male and female - > 5,000 mg/kg

(OECD Test Guideline 402)

No data available

Skin corrosion/irritation

Skin - Rabbit

Result: Irritating to skin. - 24 h

(OECD Test Guideline 404)

Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Eye irritation

(OECD Test Guideline 405)

Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Respiratory or skin sensitization

Local lymph node assay (LLNA) - Mouse

Result: negative

(OECD Test Guideline 429)

Germ cell mutagenicity

Test Type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

Test Type: In vitro mammalian cell gene mutation test

Test system: Chinese hamster ovary cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: negative

Test Type: unscheduled DNA synthesis assay

Test system: rat hepatocytes

Method: OECD Test Guideline 482

Result: negative

Test Type: In vivo micronucleus test

Species: Mouse

Cell type: Bone marrow
Application Route: Oral
Method: OECD Test Guideline 474
Result: negative

Test Type: Chromosome aberration test
Species: Chinese hamster
Cell type: Bone marrow
Application Route: Oral
Method: OECD Test Guideline 475
Result: negative

Carcinogenicity

No data available

Reproductive toxicity

May damage the unborn child.
May damage fertility.

Specific target organ toxicity - single exposure

Inhalation - May cause respiratory irritation. - Respiratory system

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

11.2 Additional Information

Repeated dose toxicity - Rabbit - male - Dermal - 20 d - NOAEL (No observed adverse effect level) - 826 mg/kg - LOAEL (Lowest observed adverse effect level) - 1,653 mg/kg
Remarks: Subacute toxicity

Prolonged or repeated exposure may cause: Vomiting, Diarrhea, Abdominal pain, Rats exposed to 1-methyl-2-pyrrolidinone at a concentration of 1 mg/L as an aerosol for 10 days showed depletion of hematopoietic cells in the bone marrow and atrophy of the lymphoid tissues of the thymus, spleen, and lymph nodes.

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Bone marrow - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	static test LC50 - Oncorhynchus mykiss (rainbow trout) - > 500 mg/l - 96 h Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - ca. 4,897 mg/l - 48 h Remarks: (IUCLID)
Toxicity to algae	static test EC50 - Desmodesmus subspicatus (green algae) - 672.8 mg/l - 72 h (DIN 38412)

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 28 d
Result: 73 % - Readily biodegradable.
(OECD Test Guideline 301C)

Biochemical Oxygen Demand (BOD) 1.100 mg/g
Remarks: (Lit.)

Chemical Oxygen Demand (COD) 1.600 mg/g
Remarks: (Lit.)

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions. Notice Directive on waste 2008/98/EC.

SECTION 14: Transport information

14.1 UN number

ADR/RID: - IMDG: - IATA: -

14.2 UN proper shipping name

ADR/RID: Not dangerous goods
IMDG: Not dangerous goods
IATA: Not dangerous goods

14.3 Transport hazard class(es)

ADR/RID: - IMDG: - IATA: -

14.4 Packaging group

ADR/RID: - IMDG: - IATA: -

14.5 Environmental hazards

ADR/RID: no IMDG Marine pollutant: no IATA: no

14.6 Special precautions for user

Further information

Not classified as dangerous in the meaning of transport regulations.

SECTION 15: Regulatory information

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

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

Authorisations and/or restrictions on use

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : N-methyl-2-pyrrolidone

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII) : N-methyl-2-pyrrolidone

Other regulations

Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

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

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H360FD	May damage fertility. May damage the unborn child.

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Annex: Exposure scenario

Identified uses:

Use: Formulation of preparations

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
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)
ERC2: Formulation of preparations

Use: Formulation of preparations

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
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)
ERC2: Formulation of preparations

Use: Industrial use of processing aids in processes and products, not becoming part of articles

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
PC20: Products such as pH-regulators, flocculants, precipitants, neutralization agents
PC21: Laboratory chemicals
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
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Use: Industrial use of processing aids in processes and products, not becoming part of articles

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
PC20: Products such as pH-regulators, flocculants, precipitants, neutralization agents
PC21: Laboratory chemicals
PROC7: Industrial spraying
PROC10: Roller application or brushing
PROC13: Treatment of articles by dipping and pouring
PROC15: Use as laboratory reagent
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Use: Used as laboratory reagent.

SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
PC20: Products such as pH-regulators, flocculants, precipitants, neutralization agents
PC21: Laboratory chemicals
PROC15: Use as laboratory reagent
ERC8b: Wide dispersive indoor use of reactive substances in open systems

1. Short title of Exposure Scenario: Formulation of preparations

Main User Groups	: SU 3
Sectors of end-use	: SU 3
Process categories	: PROC3, PROC4, PROC5
Environmental Release Categories	: ERC2:

2. Exposure scenario**2.1 Contributing scenario controlling environmental exposure for: ERC2****Product characteristics**

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC3, PROC4, PROC5**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

Frequency and duration of use

Application duration : > 4 h

Frequency of use : 220 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Provide adequate ventilation., Good work practice required.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimize exposures.

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

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0.686 mg/kg BW/d	0.143
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	8.674 mg/m ³	0.586
PROC4	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	1.371 mg/kg BW/d	0.286
PROC4	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	6.196 mg/m ³	0.419
PROC5	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	1.371 mg/kg BW/d	0.286
PROC5	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	6.196 mg/m ³	0.419

*Risk characterisation ratio

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 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).

1. Short title of Exposure Scenario: Formulation of preparations

Main User Groups : **SU 3**
Sectors of end-use : **SU 3**
Process categories : **PROC8a, PROC8b, PROC9**
Environmental Release Categories : **ERC2:**

2. Exposure scenario

2.1 Contributing scenario controlling environmental exposure for: ERC2

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b, PROC9

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

Frequency and duration of use

Application duration : > 4 h

Frequency of use : 220 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Use only in area provided with appropriate exhaust ventilation., Good work practice required.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimize exposures.

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

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC8a	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1.371 mg/kg BW/d	0.286
PROC8a	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	4.131 mg/m ³	0.279
PROC8b	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	6.169 mg/m ³	0.417
PROC8b	ECETOC TRA	Without Local	Dermal	1.371 mg/kg	0.286

		Exhaust Ventilation		BW/d	
PROC9	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	1.371 mg/kg BW/d	0.286
PROC9	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	6.196 mg/m ³	0.419

*Risk characterisation ratio

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 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).

1. Short title of Exposure Scenario: Industrial use of processing aids in processes and products, not becoming part of articles

Main User Groups : **SU 3**
 Sectors of end-use : **SU 3**
 Chemical product category : **PC20, PC21**
 Process categories : **PROC1, PROC2, PROC3, PROC4**
 Environmental Release Categories : **ERC4:**

2. Exposure scenario

2.1 Contributing scenario controlling environmental exposure for: ERC4

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PC20, PC21

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

Frequency and duration of use

Application duration : > 4 h
 Frequency of use : 220 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Provide adequate ventilation., Good work practice required.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimize exposures.

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

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC1	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0.034 mg/kg BW/d	0.007
PROC1	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	0.041 mg/m ³	0.003
PROC2	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	4.131 mg/m ³	0.279
PROC2	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1.371 mg/kg BW/d	0.286
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0.686 mg/kg BW/d	0.143
PROC3	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	8.674 mg/m ³	0.586
PROC4	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	6.196 mg/m ³	0.419
PROC4	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	1.371 mg/kg BW/d	0.286

*Risk characterisation ratio

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 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).

1. Short title of Exposure Scenario: Industrial use of processing aids in processes and products, not becoming part of articles

Main User Groups : **SU 3**
Sectors of end-use : **SU 3**
Chemical product category : **PC20, PC21**
Process categories : **PROC7, PROC10, PROC13, PROC15**
Environmental Release Categories : **ERC4:**

2. Exposure scenario

2.1 Contributing scenario controlling environmental exposure for: ERC4

Product characteristics

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC7, PROC10, PROC13, PROC15, PC20, PC21

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

Frequency and duration of use

Application duration : > 4 h
Frequency of use : 220 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Good work practice required.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimize exposures.

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

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC7	ECETOC TRA	With Local	Dermal	2.143 mg/kg	0.446

		Exhaust Ventilation		BW/d	
PROC7	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	7.1 mg/m ³	0.48
PROC10	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	4.131 mg/m ³	0.279
PROC10	ECETOC TRA	With Local Exhaust Ventilation	Dermal	1.371 mg/kg BW/d	0.286
PROC13	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	4.131 mg/m ³	0.279
PROC13	ECETOC TRA	With Local Exhaust Ventilation	Dermal	2.743 mg/kg BW/d	0.571
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0.069 mg/kg BW/d	0.014
PROC15	ECETOC TRA	With Local Exhaust Ventilation	Dermal	0.069 mg/kg BW/d	0.014
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	6.196 mg/m ³	0.419
PROC15	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	2.065 mg/m ³	0.14

*Risk characterisation ratio

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 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).

1. Short title of Exposure Scenario: Used as laboratory reagent.

Main User Groups : **SU 22**
 Sectors of end-use : **SU 22**
 Chemical product category : **PC20, PC21**
 Process categories : **PROC15**
 Environmental Release Categories : **ERC8b:**

2. Exposure scenario

2.1 Contributing scenario controlling environmental exposure for: ERC8b

Product characteristics

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

Mixture/Article up to 100 % (unless stated differently).

2.2 Contributing scenario controlling worker exposure for: PROC15, PC20, PC21

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

Frequency and duration of use

Application duration : > 4 h
Frequency of use : 220 days/year

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Technical conditions and measures

Provide adequate ventilation., Good work practice required.

Organizational measures to prevent /limit releases, dispersion and exposure

Ensure operatives are trained to minimize exposures.

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

Use suitable eye protection and gloves., For personal protection see section 8.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC15	ECETOC TRA	With Local Exhaust Ventilation	Dermal	0.069 mg/kg BW/d	0.014
PROC15	ECETOC TRA	With Local Exhaust Ventilation	Inhalation	2.065 mg/m ³	0.14
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Dermal	0.069 mg/kg BW/d	0.014
PROC15	ECETOC TRA	Without Local Exhaust Ventilation	Inhalation	6.196 mg/m ³	0.419

*Risk characterisation ratio

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 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).