

**SAFETY DATA SHEET**

according to Regulation (EC) No. 1907/2006

Version 7.9  
Revision Date 04.03.2024  
Print Date 05.10.2024**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifiers**

Product name : Cyclohexane

Product Number : 28920

Brand : Sigma-Aldrich

Index-No. : 601-017-00-1

REACH No. : 01-2119463273-41-XXXX

CAS-No. : 110-82-7

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

Identified uses : Laboratory chemicals, Manufacture of substances

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

Company : Merck Life Science UK Limited  
New Road  
The Old Brickyard  
GILLINGHAM  
Dorset  
SP8 4XT  
UNITED KINGDOM

Telephone : +44 (0)1747 833-000

Fax : +44 (0)1747 833-313

E-mail address : TechnicalService@merckgroup.com

**1.4 Emergency telephone**

Emergency Phone # : +44 (0)870 8200418 (CHEMTREC)

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture**

**Classification according to Regulation (EC) No 1272/2008 as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567**

Flammable liquids, (Category 2) H225: Highly flammable liquid and vapor.

Skin irritation, (Category 2) H315: Causes skin irritation.

Specific target organ toxicity - single exposure, (Category 3), H336: May cause drowsiness or dizziness.

Central nervous system

Aspiration hazard, (Category 1) H304: May be fatal if swallowed and enters airways.

Short-term (acute) aquatic hazard, (Category 1) H400: Very toxic to aquatic life.

Long-term (chronic) aquatic hazard, (Category 1) H410: Very toxic to aquatic life with long lasting effects.

## 2.2 Label elements

### Labelling according Regulation (EC) No 1272/2008 as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567

Pictogram



Signal Word Danger

Hazard Statements

H225 Highly flammable liquid and vapor.  
H304 May be fatal if swallowed and enters airways.  
H315 Causes skin irritation.  
H336 May cause drowsiness or dizziness.  
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P233 Keep container tightly closed.  
P273 Avoid release to the environment.  
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.  
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.  
P331 Do NOT induce vomiting.

Supplemental Hazard Statements none

### Reduced Labeling (<= 125 ml)

Pictogram



Signal Word Danger

Hazard Statements

H304 May be fatal if swallowed and enters airways.

Precautionary Statements

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.  
P331 Do NOT induce vomiting.

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.

Ecological information:

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information:

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Formula : C<sub>6</sub>H<sub>12</sub>  
Molecular weight : 84.16 g/mol  
CAS-No. : 110-82-7  
EC-No. : 203-806-2  
Index-No. : 601-017-00-1

Component		Classification	Concentration
<b>Cyclohexane</b>			
CAS-No.	110-82-7	Flam. Liq. 2; Skin Irrit. 2; STOT SE 3; Asp. Tox. 1; Aquatic Acute 1; Aquatic Chronic 1; H225, H315, H336, H304, H400, H410 Concentration limits: 20 %: STOT SE 3, H336; M-Factor - Aquatic Acute: 1	<= 100 %
EC-No.	203-806-2		
Index-No.	601-017-00-1		

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.

#### In case of eye contact

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

**If swallowed**

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately.

**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

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**SECTION 5: Firefighting measures****5.1 Extinguishing media****Suitable extinguishing media**

Foam Carbon dioxide (CO<sub>2</sub>) 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

Combustible.

Pay attention to flashback.

Vapors are heavier than air and may spread along floors.

Development of hazardous combustion gases or vapours possible in the event of fire.

Forms explosive mixtures with air at ambient temperatures.

**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. Prevent fire extinguishing water from contaminating surface water or the ground water system.

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**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures**

Advice for non-emergency personnel: Do not breathe 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. Risk of explosion.

**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

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Store under inert gas.

#### Storage class

Storage class (TRGS 510): 3: Flammable liquids

### 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.	Control parameters	Value	Basis
Cyclohexane	110-82-7	TWA	200 ppm 700 mg/m <sup>3</sup>	Europe. Indicative occupational exposure limit values
	Remarks	Indicative		
		TWA	100 ppm 350 mg/m <sup>3</sup>	UK. EH40 WEL - Workplace Exposure Limits
		STEL	300 ppm 1,050 mg/m <sup>3</sup>	UK. EH40 WEL - Workplace Exposure Limits

#### Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Worker DNEL,	inhalation	Local effects	700 mg/m <sup>3</sup>

acute			
Worker DNEL, acute	inhalation	Systemic effects	700 mg/m3
Worker DNEL, longterm	inhalation	Systemic effects	700 mg/m3
Worker DNEL, longterm	dermal	Systemic effects	
Worker DNEL, longterm	inhalation	Local effects	700 mg/m3
Consumer DNEL, acute	inhalation	Local effects	412 mg/m3
Consumer DNEL, acute	inhalation	Systemic effects	412 mg/m3
Consumer DNEL, longterm	inhalation	Local effects	206 mg/m3
Consumer DNEL, longterm	inhalation	Systemic effects	206 mg/m3
Consumer DNEL, longterm	dermal	Systemic effects	
Consumer DNEL, longterm	oral	Systemic effects	

#### **Predicted No Effect Concentration (PNEC)**

Compartment	Value
Fresh water	0.207 mg/l
Fresh water sediment	3.627 mg/kg
Sea water	0.207 mg/l
Aquatic intermittent release	0.207 mg/l
Sewage treatment plant	3.24 mg/l
Soil	2.99 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 EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.4 mm

Break through time: 480 min

Material tested: Camatril® (KCL 730 / Aldrich Z677442, Size M)

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 EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 30 min

Material tested: KCL 741 Dermatril® L

### **Body Protection**

Flame retardant antistatic protective clothing.

### **Respiratory protection**

Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds

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. Risk of explosion.

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

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

a) Physical state	liquid
b) Color	colorless
c) Odor	sweet
d) Melting point/freezing point	Melting point/range: 4 - 7 °C - lit.
e) Initial boiling point and boiling range	80.7 °C - lit.
f) Flammability (solid, gas)	No data available
g) Upper/lower flammability or explosive limits	Upper explosion limit: 8.3 %(V) Lower explosion limit: 1.2 %(V)
h) Flash point	-20 °C - closed cup
i) Autoignition temperature	260.0 °C
j) Decomposition temperature	No data available
k) pH	No data available
l) Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: 0.89 mPa.s at 25 °C
m) Water solubility	52 g/l at 23.5 °C - partly soluble

- |    |   |   |
|----|---|---|
| n) | Partition coefficient:<br>n-octanol/water | log Pow: 3.44 at 25 °C - Bioaccumulation is not expected. |
| o) | Vapor pressure                            | 124 hPa at 24 °C  |
| p) | Density                                   | 0.779 g/mL at 25 °C - lit.                                |
|    | Relative density                          | No data available   |
| q) | Relative vapor<br>density                 | No data available   |
| r) | Particle<br>characteristics               | No data available   |
| s) | Explosive properties                      | No data available   |
| t) | Oxidizing properties                      | none  |

## 9.2 Other safety information

No data available

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Vapors may form explosive mixture with air.

### 10.2 Chemical stability

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

### 10.3 Possibility of hazardous reactions

Risk of explosion with:  
nitrogen dioxide

Risk of ignition or formation of inflammable gases or vapours with:  
Strong oxidizing agents

### 10.4 Conditions to avoid

Warming.

### 10.5 Incompatible materials

rubber, various plastics

### 10.6 Hazardous decomposition products

In the event of fire: see section 5

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## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

LD50 Oral - Rat - male and female - > 5,000 mg/kg  
(OECD Test Guideline 401)

Symptoms: gastric pain, Stomach/intestinal disorders

LC50 Inhalation - Rat - male and female - 4 h - 19.07 mg/l - vapor



(OECD Test Guideline 403)

Symptoms: Possible damages:, Irritation symptoms in the respiratory tract., Inhalation may lead to the formation of oedemas in the respiratory tract.

LD50 Dermal - Rabbit - male and female - > 2,000 mg/kg

(OECD Test Guideline 402)

**Skin corrosion/irritation**

Remarks: Causes skin irritation.

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

**Serious eye damage/eye irritation**

Remarks: No data available

**Respiratory or skin sensitization**

Buehler Test - Guinea pig

Result: negative

(Regulation (EC) No. 440/2008, Annex, B.6)

**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: Mouse lymphoma test

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: negative

Test Type: Chromosome aberration test

Species: Rat

Cell type: Bone marrow

Application Route: inhalation (vapor)

Method: OECD Test Guideline 475

Result: negative

**Carcinogenicity**

No data available

**Reproductive toxicity**

No data available

**Specific target organ toxicity - single exposure**

May cause drowsiness or dizziness.

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

May be fatal if swallowed and enters airways.

Aspiration hazard, Aspiration may cause pulmonary edema and pneumonitis.

## 11.2 Additional Information

### Endocrine disrupting properties

#### Product:

Assessment

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Repeated dose toxicity - Rat - male and female - Inhalation - 90 d

Remarks: Subchronic toxicity

RTECS: GU6300000

Central nervous system depression, Drowsiness, Irritability, Dizziness, Gastrointestinal disturbance, Lung irritation, chest pain, pulmonary edema

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

After uptake of large quantities:

Unconsciousness

Damage to:

Lungs

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

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## SECTION 12: Ecological information

### 12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Pimephales promelas (fathead minnow) - 4.53 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 0.9 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	ErC50 - Pseudokirchneriella subcapitata (green algae) - > 4.425 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to bacteria	IC50 - Bacteria - 29 mg/l - 15 h Remarks: (ECHA)

### 12.2 Persistence and degradability

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The life science business of Merck operates as MilliporeSigma in the US and Canada



Biodegradability aerobic - Exposure time 28 d  
Result: 77 % - Readily biodegradable.  
(OECD Test Guideline 301F)

### 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 Endocrine disrupting properties

#### Product:

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

### 12.7 Other adverse effects

Biological effects:

Endangers drinking-water supplies if allowed to enter soil and/or waters in large quantities.

Change in the flavour characteristics of fish protein.

Discharge into the environment must be avoided.

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## 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. Notice Directive on waste 2008/98/EC.

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## SECTION 14: Transport information

### 14.1 UN number

ADR/RID: 1145

IMDG: 1145

IATA: 1145

### 14.2 UN proper shipping name

ADR/RID: CYCLOHEXANE

IMDG: CYCLOHEXANE

IATA: Cyclohexane

**14.3 Transport hazard class(es)**

ADR/RID: 3

IMDG: 3

IATA: 3

**14.4 Packaging group**

ADR/RID: II

IMDG: II

IATA: II

**14.5 Environmental hazards**

ADR/RID: yes

IMDG Marine pollutant: yes

IATA: no

**14.6 Special precautions for user**

Tunnel restriction code : (D/E)

Further information : No data available

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**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 - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) : Cyclohexane

**National legislation**

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

P5c

FLAMMABLE LIQUIDS

E1

ENVIRONMENTAL HAZARDS

**Other regulations**

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.

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**SECTION 16: Other information****Full text of H-Statements**

H225	Highly flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

## Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

## Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. 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](http://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: Industrial use

<b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
<b>SU 3, SU9, SU 10:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites, Manufacture of fine chemicals, Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
<b>PC19:</b> Intermediate
<b>PC21:</b> Laboratory chemicals
<b>PROC1:</b> Use in closed process, no likelihood of exposure
<b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure
<b>PROC3:</b> Use in closed batch process (synthesis or formulation)
<b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises
<b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)
<b>PROC8a:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
<b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
<b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
<b>PROC10:</b> Roller application or brushing
<b>PROC15:</b> Use as laboratory reagent
<b>ERC1, ERC2, ERC4, ERC6a:</b> Manufacture of substances, Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in manufacture of another substance (use of intermediates)

#### Use: Professional use

<b>SU 22:</b> Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
<b>SU 22:</b> Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
<b>PC21:</b> Laboratory chemicals
<b>PROC15:</b> Use as laboratory reagent
<b>ERC2, ERC6a:</b> Formulation of preparations, Industrial use resulting in manufacture of another substance (use of intermediates)

### 1. Short title of Exposure Scenario: Industrial use

Main User Groups	: <b>SU 3</b>
Sectors of end-use	: <b>SU 3, SU9, SU 10</b>
Chemical product category	: <b>PC19, PC21</b>
Process categories	: <b>PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a,</b>

## 2. Exposure scenario

### 2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC4, SpERC ESVOC 2

#### 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 : 300  
Emission or Release Factor: Air : 0.2 %  
Emission or Release Factor: Water : 0.03 %  
Emission or Release Factor: Soil : 0.1 %

#### Technical conditions and measures / Organizational measures

Air : Use of air emission abatement equipments.  
(Effectiveness (of a measure): 90 %)

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

Type of Sewage Treatment Plant : Municipal sewage treatment plant  
Effectiveness (of a measure) : 96.6 %  
Sludge Treatment : Sewage sludge should not be applied to natural soils.

### 2.1 Contributing scenario controlling environmental exposure for: ERC2, SpERC ESVOC 4

Annual amount per site (Msafe) : 1,714 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 : 300  
Emission or Release Factor: Air : 2.5 %  
Emission or Release Factor: Water : 0.02 %  
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  
Effectiveness (of a measure) : 96.6 %  
Sludge Treatment : Sewage sludge should not be applied to natural soils.

### 2.1 Contributing scenario controlling environmental exposure for: ERC6a, SpERC ESVOC 43

#### 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 : 300  
Emission or Release Factor: Air : 0.2 %  
Emission or Release Factor: Water : 0.03 %  
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  
Effectiveness (of a measure) : 96.6 %  
Sludge Treatment : Sewage sludge should not be applied to natural soils.

**2.4 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8b, PROC15**

**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) : High volatile liquid

**Frequency and duration of use**

Frequency of use : 8 hours/day

**Other operational conditions affecting workers exposure**

Outdoor / Indoor : Indoor without local exhaust ventilation (LEV)

**Organizational measures to prevent /limit releases, dispersion and exposure**

Covers daily exposures up to 8 hours.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Wear suitable gloves tested to EN374.

**2.5 Contributing scenario controlling worker exposure for: PROC5, PROC8a, PROC9, PROC10**

**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) : High volatile liquid

**Frequency and duration of use**

Frequency of use : 8 hours/day

**Other operational conditions affecting workers exposure**

Outdoor / Indoor : Indoor with local exhaust ventilation (LEV)

**Organizational measures to prevent /limit releases, dispersion and exposure**

Covers daily exposures up to 8 hours.

**Additional good practice advice beyond the REACH Chemical Safety Assessment**

Wear suitable gloves tested to EN374.

**3. Exposure estimation and reference to its source**

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The life science business of Merck operates as MilliporeSigma in the US and Canada



## Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure	RCR*
ERC1	EUSES		All compartments			< 1
ERC2	EUSES		All compartments		1714kg/day	< 1
ERC6a	EUSES		All compartments			< 1

## Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC1	ECETOC TRA	longterm, combined, systemic			< 1
PROC2	ECETOC TRA	longterm, combined, systemic			< 1
PROC3	ECETOC TRA	longterm, combined, systemic			< 1
PROC4	ECETOC TRA	longterm, combined, systemic			< 1
PROC8b	ECETOC TRA	longterm, combined, systemic			< 1
PROC15	ECETOC TRA	longterm, combined, systemic			< 1

\*Risk characterisation ratio

PROC5	ECETOC TRA	longterm, combined, systemic			< 1
PROC8a	ECETOC TRA	longterm, combined, systemic			< 1
PROC9	ECETOC TRA	longterm, combined, systemic			< 1
PROC10	ECETOC TRA	longterm, combined, systemic			< 1

\*Risk characterisation ratio

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

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

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).

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#### 1. Short title of Exposure Scenario: Professional use

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Main User Groups	: SU 22
Sectors of end-use	: SU 22
Chemical product category	: PC21
Process categories	: PROC15
Environmental Release Categories	: ERC2, ERC6a:

#### 2. Exposure scenario

##### 2.1 Contributing scenario controlling environmental exposure for: ERC2, SpERC ESVOC 4

Annual amount per site (Msafe) : 1,714 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 : 300

Emission or Release Factor: Air : 2.5 %

Emission or Release Factor: : 0.02 %

Water

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

Effectiveness (of a measure) : 96.6 %

Sludge Treatment : Sewage sludge should not be applied to natural soils.

## 2.1 Contributing scenario controlling environmental exposure for: ERC6a, SpERC ESVOC 43

### 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 : 300  
Emission or Release Factor: Air : 0.2 %  
Emission or Release Factor: Water : 0.03 %  
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  
Effectiveness (of a measure) : 96.6 %  
Sludge Treatment : Sewage sludge should not be applied to natural soils.

## 2.3 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 % (unless stated differently).  
Physical Form (at time of use) : High volatile liquid

### Frequency and duration of use

Frequency of use : 8 hours/day

### Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor without local exhaust ventilation (LEV)

### Organizational measures to prevent /limit releases, dispersion and exposure

Covers daily exposures up to 8 hours.

### Additional good practice advice beyond the REACH Chemical Safety Assessment

Wear suitable gloves tested to EN374.

## 3. Exposure estimation and reference to its source

### Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value	Level of Exposure	RCR*
ERC2	EUSES		All compartments		1714kg/day	< 1
ERC6a	EUSES		All compartments			< 1

### Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC15	ECETOC TRA	longterm, combined, systemic			< 1

\*Risk characterisation ratio

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

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