

**SAFETY DATA SHEET**

according to Regulation (EC) No. 1907/2006

Version 6.11  
Revision Date 10.04.2023  
Print Date 22.07.2023**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifiers**

Product name : Sulfuric acid

Product Number : 339741

Brand : Aldrich

Index-No. : 016-020-00-8

REACH No. : 01-2119458838-20-XXXX

CAS-No. : 7664-93-9

**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**

Corrosive to Metals (Category 1), H290  
Skin corrosion (Sub-category 1A), H314  
Serious eye damage (Category 1), H318

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 as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567

Pictogram



|                                |                                                                                                                                  |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Signal Word                    | Danger                                                                                                                           |
| Hazard statement(s)            |                                                                                                                                  |
| H290                           | May be corrosive to metals.                                                                                                      |
| H314                           | Causes severe skin burns and eye damage.                                                                                         |
| Precautionary statement(s)     |                                                                                                                                  |
| P234                           | Keep only in original packaging.                                                                                                 |
| P280                           | Wear protective gloves/ protective clothing/ eye protection/ face protection.                                                    |
| P303 + P361 + P353             | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.                                     |
| P304 + P340 + P310             | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.             |
| P305 + P351 + P338             | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P363                           | Wash contaminated clothing before reuse.                                                                                         |
| Supplemental Hazard Statements | none                                                                                                                             |

### Reduced Labeling (<= 125 ml)

Pictogram



|                                |                                                                                                                                  |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Signal Word                    | Danger                                                                                                                           |
| Hazard statement(s)            |                                                                                                                                  |
| H314                           | Causes severe skin burns and eye damage.                                                                                         |
| Precautionary statement(s)     |                                                                                                                                  |
| P280                           | Wear protective gloves/ protective clothing/ eye protection/ face protection.                                                    |
| P303 + P361 + P353             | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.                                     |
| P304 + P340 + P310             | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.             |
| P305 + P351 + P338             | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P363                           | Wash contaminated clothing before reuse.                                                                                         |
| 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 :  $\text{H}_2\text{O}_4\text{S}$   
Molecular weight : 98.08 g/mol  
CAS-No. : 7664-93-9  
EC-No. : 231-639-5  
Index-No. : 016-020-00-8

| Component             |              | Classification                                                                                                               | Concentration |
|-----------------------|--------------|------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>sulphuric acid</b> |              |                                                                                                                              |               |
| CAS-No.               | 7664-93-9    | Met. Corr. 1; Skin Corr. 1A; Eye Dam. 1; H290, H314, H318                                                                    | <= 100 %      |
| EC-No.                | 231-639-5    | Concentration limits:                                                                                                        |               |
| Index-No.             | 016-020-00-8 | >= 15 %: Skin Corr. 1A, H314; 5 - < 15 %: Skin Irrit. 2, H315; 5 - < 15 %: Eye Irrit. 2, H319; >= 0.3 %: Met. Corr. 1, H290; |               |

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

## SECTION 4: First aid measures

### 4.1 Description of first-aid measures

#### General advice

First aiders need to protect themselves. 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. Call a physician immediately.

#### In case of eye contact

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

#### If swallowed

After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

### 4.2 Most important symptoms and effects, both acute and delayed

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**

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

#### **Unsuitable extinguishing media**

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

### 5.2 Special hazards arising from the substance or mixture

Sulfur oxides

Not combustible.

Ambient fire may liberate hazardous vapours.

### 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

Suppress (knock down) gases/vapors/mists with a water spray jet. 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. 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 with liquid-absorbent and neutralising material (e.g. Chemizorb® H<sup>+</sup>, Merck Art. No. 101595). Dispose of properly. Clean up affected area.

### 6.4 Reference to other sections

For disposal see section 13.

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## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

For precautions see section 2.2.

### 7.2 Conditions for safe storage, including any incompatibilities

#### **Storage conditions**

No metal containers.

Tightly closed.

#### **Storage class**

Storage class (TRGS 510): 8B: Non-combustible, corrosive hazardous materials

### 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 parameter s | Value                                 | Basis                                                                                                                                                                                                            |
|----------------|-----------|---------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| sulphuric acid | 7664-93-9 | TWA                 | 0.05 mg/m3<br>Mist                    | 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   | Indicative          |                                       |                                                                                                                                                                                                                  |
|                |           | TWA                 | 0.05 mg/m3<br>Mist, thoracic fraction | UK. EH40 WEL - Workplace Exposure Limits                                                                                                                                                                         |

### 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). Tightly fitting safety goggles

##### 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](http://www.kcl.de)).

Full contact

Material: Viton®

Minimum layer thickness: 0.7 mm

Break through time: 480 min

Material tested: Vitoject® (KCL 890 / Aldrich Z677698, 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 EN374 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: butyl-rubber

Minimum layer thickness: 0.7 mm

Break through time: 120 min  
Material tested: Butoject® (KCL 898)

### **Body Protection**

Acid-resistant protective clothing

### **Respiratory protection**

Recommended Filter type: Filter type 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.

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

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

|                                                 |                                                                                  |
|-------------------------------------------------|----------------------------------------------------------------------------------|
| a) Physical state                               | clear, liquid                                                                    |
| b) Color                                        | colorless                                                                        |
| c) Odor                                         | odorless                                                                         |
| d) Melting point/freezing point                 | Melting point: 10.31 °C                                                          |
| e) Initial boiling point and boiling range      | 290 °C - lit.                                                                    |
| f) Flammability (solid, gas)                    | No data available                                                                |
| g) Upper/lower flammability or explosive limits | No data available                                                                |
| h) Flash point                                  | No data available                                                                |
| i) Autoignition temperature                     | No data available                                                                |
| j) Decomposition temperature                    | No data available                                                                |
| k) pH                                           | 1.2 at 5 g/l                                                                     |
| l) Viscosity                                    | Viscosity, kinematic: No data available<br>Viscosity, dynamic: 23 mPa.s at 20 °C |
| m) Water solubility                             | soluble                                                                          |
| n) Partition coefficient: n-octanol/water       | Not applicable for inorganic substances                                          |
| o) Vapor pressure                               | 1.33 hPa at 145.8 °C                                                             |
| p) Density                                      | 1.84 g/cm <sup>3</sup> at 25 °C - lit.                                           |
| Relative density                                | No data available                                                                |

- |                             |                   |
|-----------------------------|-------------------|
| q) Relative vapor density   | No data available |
| r) Particle characteristics | No data available |
| s) Explosive properties     | No data available |
| t) Oxidizing properties     | none              |

## 9.2 Other safety information

Surface tension 55.1 mN/m at 20 °C

Relative vapor density 3.39 - (Air = 1.0)

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

No data available

### 10.2 Chemical stability

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

### 10.3 Possibility of hazardous reactions

A risk of explosion and/or of toxic gas formation exists with the following substances:

Water  
Alkali metals  
alkali compounds  
Ammonia  
Aldehydes  
acetonitrile  
Alkaline earth metals  
alkalines  
Acids  
alkaline earth compounds  
Metals  
metal alloys  
Oxides of phosphorus  
phosphorus  
hydrides  
halogen-halogen compounds  
oxyhalogenic compounds  
permanganates  
nitrates  
carbides  
combustible substances  
organic solvent  
acetylidene  
Nitriles  
organic nitro compounds  
anilines  
Peroxides

picrates  
nitrides  
lithium silicide  
iron(III) compounds  
bromates  
chlorates  
Amines  
perchlorates  
hydrogen peroxide

#### **10.4 Conditions to avoid**

no information available

#### **10.5 Incompatible materials**

animal/vegetable tissues Contact with metals liberates hydrogen gas.

#### **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 - 2,140 mg/kg

Remarks: (ECHA)

Inhalation: Corrosive to respiratory system.

Dermal: No data available

##### **Skin corrosion/irritation**

Skin - Rabbit

Result: Extremely corrosive and destructive to tissue.

Remarks: (IUCLID)

##### **Serious eye damage/eye irritation**

Remarks: Causes serious eye damage.

##### **Respiratory or skin sensitization**

No data available

##### **Germ cell mutagenicity**

Test Type: Ames test

Test system: Salmonella typhimurium

Result: negative

Remarks: (HSDB)

##### **Carcinogenicity**

No data available

##### **Reproductive toxicity**

No data available

##### **Specific target organ toxicity - single exposure**

No data available

##### **Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**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.

RTECS: WS5600000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Pulmonary edema. Effects may be delayed.

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

After inhalation of aerosols: damage to the affected mucous membranes. After skin contact: severe burns with formation of scabs. After eye contact: burns, corneal lesions. After swallowing: severe pain (risk of perforation!), nausea, vomiting and diarrhoea. After a latency period of several weeks possibly pyloric stenosis.

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 daphnia and other aquatic invertebrates | static test EC50 - Daphnia magna (Water flea) - > 100 mg/l - 48 h (OECD Test Guideline 202)             |
| Toxicity to algae                                   | static test ErC50 - Desmodesmus subspicatus (green algae) - > 100 mg/l - 72 h (OECD Test Guideline 201) |

**12.2 Persistence and degradability**

The methods for determining the biological degradability are not applicable to inorganic substances.

**12.3 Bioaccumulative potential**

No data available

**12.4 Mobility in soil**

No data available

**12.5 Results of PBT and vPvB assessment**

Aldrich- 339741

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



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:

Harmful effect due to pH shift.

Caustic even in diluted form.

Does not cause biological oxygen deficit.

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

Neutralisation possible in waste water treatment plants.

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. See [www.retrologistik.com](http://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.

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## SECTION 14: Transport information

### 14.1 UN number

ADR/RID: 1830

IMDG: 1830

IATA: 1830

### 14.2 UN proper shipping name

ADR/RID: SULPHURIC ACID

IMDG: SULPHURIC ACID

IATA: Sulphuric acid

### 14.3 Transport hazard class(es)

ADR/RID: 8

IMDG: 8

IATA: 8

### 14.4 Packaging group

ADR/RID: II

IMDG: II

IATA: II

### 14.5 Environmental hazards

ADR/RID: no

IMDG Marine pollutant: no

IATA: no

### 14.6 Special precautions for user

Tunnel restriction code : (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

Regulation (EU) 2019/1148 on the marketing : sulphuric acid  
and use of explosives precursors

#### 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 referred to under sections 2 and 3.

|      |                                          |
|------|------------------------------------------|
| H290 | May be corrosive to metals.              |
| H314 | Causes severe skin burns and eye damage. |
| H315 | May be corrosive to metals.              |
| H318 | Causes severe skin burns and eye damage. |
| H319 | Causes skin irritation.                  |

## 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 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](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, ERC6b:</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), Industrial use of reactive processing aids |

#### 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, ERC6b:</b> Formulation of preparations, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids |

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

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|                           |                           |
|---------------------------|---------------------------|
| 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 : **PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC15**  
Environmental Release Categories : **ERC1, ERC2, ERC4, ERC6a, ERC6b:**

## 2. Exposure scenario

### 2.1 Contributing scenario controlling environmental exposure for: ERC1

#### **Amount used**

Daily amount per site : 1500 t

#### **Environment factors not influenced by risk management**

Dilution Factor (River) : 10

#### **Other given operational conditions affecting environmental exposure**

Continuous use/release

Number of emission days per year : 365

#### **Technical conditions and measures / Organizational measures**

Air : Use of air emission abatement equipments.

Water : Solutions with low pH-value must be neutralized before discharge.

#### **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 : Sewage sludge should not be applied to natural soils.

### 2.1 Contributing scenario controlling environmental exposure for: ERC2

#### **Amount used**

Annual amount per site : 300000 t

#### **Environment factors not influenced by risk management**

Dilution Factor (River) : 10

#### **Other given operational conditions affecting environmental exposure**

Continuous use/release

Number of emission days per year : 365

#### **Technical conditions and measures / Organizational measures**

Air : Use of air emission abatement equipments.

Water : Solutions with low pH-value must be neutralized before discharge.

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

Type of Sewage Treatment Plant : Municipal sewage treatment plant

Flow rate of sewage treatment : 2,000 m3/d

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

## 2.1 Contributing scenario controlling environmental exposure for: ERC4

### Amount used

Annual amount per site : 438 t

### Environment factors not influenced by risk management

Dilution Factor (River) : 10

### Other given operational conditions affecting environmental exposure

Continuous use/release

Number of emission days per year : 365

### Technical conditions and measures / Organizational measures

Air : Use of air emission abatement equipments.

Water : Solutions with low pH-value must be neutralized before discharge.

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

Type of Sewage Treatment Plant : Municipal sewage treatment plant

Flow rate of sewage treatment : 2,000 m<sup>3</sup>/d

plant effluent

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

## 2.1 Contributing scenario controlling environmental exposure for: ERC6a

### Amount used

Annual amount per site : 300000 t

### Environment factors not influenced by risk management

Dilution Factor (River) : 10

### Other given operational conditions affecting environmental exposure

Continuous use/release

Number of emission days per year : 365

### Technical conditions and measures / Organizational measures

Air : Use of air emission abatement equipments.

Water : Solutions with low pH-value must be neutralized before discharge.

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

Type of Sewage Treatment Plant : Municipal sewage treatment plant

Flow rate of sewage treatment : 2,000 m<sup>3</sup>/d

plant effluent

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

## 2.1 Contributing scenario controlling environmental exposure for: ERC6b

### Amount used

Annual amount per site : 100000 t

### Environment factors not influenced by risk management

Dilution Factor (River) : 10

### Other given operational conditions affecting environmental exposure

Continuous use/release

Number of emission days per year : 365

**Technical conditions and measures / Organizational measures**

Air : Use of air emission abatement equipments.  
Water : Solutions with low pH-value must be neutralized before discharge.

**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 m<sup>3</sup>/d  
Sludge Treatment : Sewage sludge should not be applied to natural soils.

**2.6 Contributing scenario controlling worker exposure for: PROC1**

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Low volatile liquid  
Process Temperature : < 130 °C

**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.

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

Wear suitable gloves tested to EN374.

**2.7 Contributing scenario controlling worker exposure for: PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC15**

**Product characteristics**

Concentration of the Substance in Mixture/Article : Covers the percentage of the substance in the product up to 100 % (unless stated differently).  
Physical Form (at time of use) : Low volatile liquid  
Process Temperature : < 130 °C

**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.

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

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* |
|-----------------------|----------------------------|---------------------|------------------|-------|-------------------|------|
| ERC1                  | EUSES                      |                     | All compartments |       |                   | < 1  |
| ERC2                  | EUSES                      |                     | All compartments |       |                   | < 1  |
| ERC4                  | EUSES                      |                     | All compartments |       |                   | < 1  |
| ERC6a                 | EUSES                      |                     | All compartments |       |                   | < 1  |
| ERC6b                 | EUSES                      |                     | All compartments |       |                   | < 1  |

#### Workers

| Contributing Scenario | Exposure Assessment Method | Specific conditions         | Value | Level of Exposure | RCR* |
|-----------------------|----------------------------|-----------------------------|-------|-------------------|------|
| PROC1                 | ECETOC TRA                 | acute, inhalative, local    |       |                   | 0.41 |
| PROC1                 | ECETOC TRA                 | longterm, inhalative, local |       |                   | 0.82 |

\*Risk characterisation ratio

|        |            |                             |  |  |      |
|--------|------------|-----------------------------|--|--|------|
| PROC2  | ECETOC TRA | acute, inhalative, local    |  |  | 0.41 |
| PROC2  | ECETOC TRA | longterm, inhalative, local |  |  | 0.82 |
| PROC3  | ECETOC TRA | acute, inhalative, local    |  |  | 0.41 |
| PROC3  | ECETOC TRA | longterm, inhalative, local |  |  | 0.82 |
| PROC4  | ECETOC TRA | acute, inhalative, local    |  |  | 0.41 |
| PROC4  | ECETOC TRA | longterm, inhalative, local |  |  | 0.82 |
| PROC5  | ECETOC TRA | acute, inhalative, local    |  |  | 0.41 |
| PROC5  | ECETOC TRA | longterm, inhalative, local |  |  | 0.82 |
| PROC8a | ECETOC TRA | acute, inhalative, local    |  |  | 0.41 |
| PROC8a | ECETOC TRA | longterm, inhalative, local |  |  | 0.82 |

|        |            |                                |  |  |      |
|--------|------------|--------------------------------|--|--|------|
| PROC8b | ECETOC TRA | acute,<br>inhalative, local    |  |  | 0.20 |
| PROC8b | ECETOC TRA | longterm,<br>inhalative, local |  |  | 0.41 |
| PROC9  | ECETOC TRA | acute,<br>inhalative, local    |  |  | 0.41 |
| PROC9  | ECETOC TRA | longterm,<br>inhalative, local |  |  | 0.82 |
| PROC10 | ECETOC TRA | acute,<br>inhalative, local    |  |  | 0.41 |
| PROC10 | ECETOC TRA | longterm,<br>inhalative, local |  |  | 0.82 |
| PROC15 | ECETOC TRA | acute,<br>inhalative, local    |  |  | 0.41 |
| PROC15 | ECETOC TRA | longterm,<br>inhalative, local |  |  | 0.82 |

\*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).

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

Main User Groups : **SU 22**  
 Sectors of end-use : **SU 22**  
 Chemical product category : **PC21**  
 Process categories : **PROC15**  
 Environmental Release Categories : **ERC2, ERC6a, ERC6b:**

#### 2. Exposure scenario

## 2.1 Contributing scenario controlling environmental exposure for: ERC2

### Amount used

Annual amount per site : 300000 t

### Environment factors not influenced by risk management

Dilution Factor (River) : 10

### Other given operational conditions affecting environmental exposure

Continuous use/release

Number of emission days per year : 365

### Technical conditions and measures / Organizational measures

Air : Use of air emission abatement equipments.

Water : Solutions with low pH-value must be neutralized before discharge.

### 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 : Sewage sludge should not be applied to natural soils.

## 2.1 Contributing scenario controlling environmental exposure for: ERC6a

### Amount used

Annual amount per site : 300000 t

### Environment factors not influenced by risk management

Dilution Factor (River) : 10

### Other given operational conditions affecting environmental exposure

Continuous use/release

Number of emission days per year : 365

### Technical conditions and measures / Organizational measures

Air : Use of air emission abatement equipments.

Water : Solutions with low pH-value must be neutralized before discharge.

### 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 : Sewage sludge should not be applied to natural soils.

## 2.1 Contributing scenario controlling environmental exposure for: ERC6b

### Amount used

Annual amount per site : 100000 t

### Environment factors not influenced by risk management

Dilution Factor (River) : 10

### Other given operational conditions affecting environmental exposure

Continuous use/release

Number of emission days per year : 365

**Technical conditions and measures / Organizational measures**

Air : Use of air emission abatement equipments.  
 Water : Solutions with low pH-value must be neutralized before discharge.

**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 m<sup>3</sup>/d  
 Sludge Treatment : Sewage sludge should not be applied to natural soils.

**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 % (unless stated differently).  
 Physical Form (at time of use) : Low volatile liquid  
 Process Temperature : < 130 °C

**Frequency and duration of use**

Frequency of use : < 4 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**

Avoid carrying out operation for more than 4 hours.

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

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 |       |                   | < 1  |
| ERC6a                 | EUSES                      |                     | All compartments |       |                   | < 1  |
| ERC6b                 | EUSES                      |                     | All compartments |       |                   | < 1  |

**Workers**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Value | Level of Exposure | RCR* |
|-----------------------|----------------------------|---------------------|-------|-------------------|------|
|-----------------------|----------------------------|---------------------|-------|-------------------|------|

|        |            |                                |  |  |      |
|--------|------------|--------------------------------|--|--|------|
| PROC15 | ECETOC TRA | acute,<br>inhalative, local    |  |  | 0.82 |
| PROC15 | ECETOC TRA | longterm,<br>inhalative, local |  |  | 0.98 |

\*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).