# Sulfolane - A Anhydrous

Version 3.6 Revision Date 2023-02-22

According to Regulation (EC) No. 1907/2006, Regulation (EC) No. 2020/878

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

**Product information**

Product Name : Sulfolane - A Anhydrous
Material : 1126072, 1125132, 1122438, 1115722, 1114955, 1100709, 1098522, 1093880, 1024635, 1024637, 1024641, 1024640, 1024644, 1024636, 1024639, 1024638, 1032498, 1024634

**EC-No.Registration number**

| Chemical name | CAS-No.<br>EC-No.<br>Index No. | Legal Entity<br>Registration number |
|---|---|---|
| Sulfolane | 126-33-0<br>204-783-1<br>016-031-00-8 | Chevron Phillips Chemicals International NV<br>01-2119565139-32-0000 |
| Sulfolane | 126-33-0<br>204-783-1<br>016-031-00-8 | Chevron Phillips Chemical Company LP<br>01-2119565139-32-0000 |

### 1.2

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

Relevant Identified Uses Supported : Use as an aromatics extraction solvent - industrial
Use in acid gas purification – industrial
Formulation
Use as a cleaning agent – industrial

### 1.3

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

**Company** : Chevron Phillips Chemical Company LP
Specialty Chemicals
10001 Six Pines Drive
The Woodlands, TX 77380

Local : Chevron Phillips Chemicals International N.V.
Airport Plaza (Stockholm Building)
Leonardo Da Vincilaan 19
1831 Diegem
Belgium

SDS Requests: (800) 852-5530
Responsible Party: Product Safety Group
Email:sds@cpchem.com

**1.4**

**Emergency telephone:**

**Health**:
866.442.9628 (North America)
1.832.813.4984 (International)
**Transport**:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)
Belgium: 070 245 245 (24 hours/day, 7 days/week)
Bulgaria: +359 2 9154 233
Croatia: +3851 2348 342 (24 hours/day, 7 days/week)
Cyprus: 1401
Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402
Denmark: Danish Poison Center (Giftlinjen): +45 8212 1212
Estonia: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Finland: 0800 147 111 09 471 977 (24 hours/day)
France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)
Germany: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Greece: (0030) 2107793777 (24 hours/day, 7 days/week)
Hungary: +36-80-201-199 (24 hours/day, 7 days/week)
Iceland: 543 2222 (24 hours/day, 7 days/week)
Ireland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Italy: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)
Liechtenstein: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Lithuania: +370 (85) 2362052
Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)
Malta: +356 2395 2000
The Netherlands: NVIC: +31 (0)88 755 8000
Norway: 22 59 13 00 (24 hours/day, 7 days/week)
Poland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Portugal: CIAV phone number: +351 800 250 250
Romania: +40213183606
Slovakia: +421 2 5477 4166
Slovenia: Phone number: 112
Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24 hours/day, 7 days/week)
Sweden: 112 – ask for Poisons Information

| | | |
|---|---|---|
| Responsible Department | : | Product Safety and Toxicology Group |
| E-mail address | : | SDS@CPChem.com |
| Website | : | www.CPChem.com |

## SECTION 2: Hazards identification

**2.1**

**Classification of the substance or mixture**
**REGULATION (EC) No 1272/2008**

| | |
|---|---|
| Acute toxicity, Category 4 | H302:<br>Harmful if swallowed. |
| Reproductive toxicity, Category 1B | H360:<br>May damage fertility or the unborn child. |

**2.2**

**Labeling (REGULATION (EC) No 1272/2008)**

Hazard pictograms :

Signal Word : Danger

| | | |
|---|---|---|
| Hazard Statements : | H302 | Harmful if swallowed. |
| | H360 | May damage fertility or the unborn child. |
| Precautionary Statements : | **Prevention:** | |
| | P201 | Obtain special instructions before use. |
| | P202 | Do not handle until all safety precautions have been read and understood. |
| | P264 | Wash skin thoroughly after handling. |
| | P280 | Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection. |
| | **Response:** | |
| | P308 + P313 | IF exposed or concerned: Get medical advice/ attention. |
| | **Disposal:** | |
| | P501 | Dispose of contents/ container to an approved waste disposal plant. |

Hazardous ingredients which must be listed on the label:
- 126-33-0 Sulfolane

**Additional Labeling:**

The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 1 %
The following percentage of the mixture consists of ingredient(s) with unknown hazards to the aquatic environment: 1 %

**2.3**

**Other hazards**

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.

Endocrine disrupting properties : 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 - 3.2**
**Substance or Mixture**

Synonyms : Tetramethylene Sulfone
Sulfolane Anhydrous
Tetrahydrothiophene 1,1-dioxide

Molecular formula : C4H8SO2

**Hazardous ingredients**

| Chemical name | CAS-No.<br>EC-No.<br>Index No. | Classification (REGULATION (EC) No 1272/2008) | Concentration [wt%] | Specific Conc. Limits, M-factors and ATEs |
|---|---|---|---|---|
| Sulfolane | 126-33-0<br>204-783-1<br>016-031-00-8 | Acute Tox. 4; H302<br>Repr. 1B; H360 | 99 - 100 | |

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 : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance.

If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of eye contact : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

**4.2 Most important symptoms and effects, both acute and delayed**
**Notes to physician**

Symptoms : No data available.

Risks : No data available.

**4.3 Indication of any immediate medical attention and special treatment needed**

Treatment : No data available.

## SECTION 5: Firefighting measures

| | | |
|---|---|---|
| Flash point | : | 166°C (331°F)<br>Method: closed cup |
| Autoignition temperature | : | No data available |

**5.1 Extinguishing media**

| | | |
|---|---|---|
| Unsuitable extinguishing media | : | High volume water jet. |

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

| | | |
|---|---|---|
| Specific hazards during fire fighting | : | Do not allow run-off from fire fighting to enter drains or water courses. |

**5.3 Advice for firefighters**

| | | |
|---|---|---|
| Special protective equipment for fire-fighters | : | Wear self-contained breathing apparatus for firefighting if necessary. |
| Further information | : | Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. |
| Fire and explosion protection | : | Normal measures for preventive fire protection. |
| Hazardous decomposition products | : | Carbon oxides. Sulfur oxides. |

## SECTION 6: Accidental release measures

**6.1 Personal precautions, protective equipment and emergency procedures**

| | | |
|---|---|---|
| Personal precautions | : | Use personal protective equipment. |

**6.2 Environmental precautions**

| | | |
|---|---|---|
| Environmental precautions | : | Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities. |

**6.3 Methods and materials for containment and cleaning up**

| | | |
|---|---|---|
| Methods for cleaning up | : | Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. |

**6.4 Reference to other sections**

| | | |
|---|---|---|
| Reference to other sections | : | For personal protection see section 8. For disposal considerations see section 13. |

## SECTION 7: Handling and storage

**7.1**

**Precautions for safe handling**
**Handling**

Advice on safe handling : Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

**7.2**

**Conditions for safe storage, including any incompatibilities**

**Storage**

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

**7.3**

**Specific End Use**
Use : For additional details, see the Exposure Scenario in the Annex portion

## SECTION 8: Exposure controls/personal protection

**8.1**

**Control parameters**

**Chevron Phillips Chemical Company LP**

| Components | Basis | Value | Control parameters | Note |
|---|---|---|---|---|
| Sulfolane | Manufacturer | TWA | 0,37 ppm, | |

DNEL : End Use: Workers
Routes of exposure: Dermal
Potential health effects: Long-term systemic effects
Value: 0,2 mg/kg

DNEL : End Use: Workers
Routes of exposure: Inhalation
Potential health effects: Long-term systemic effects
Value: 2,16 mg/m3

DNEL : End Use: Consumers
Routes of exposure: Dermal
Potential health effects: Long-term systemic effects
Value: 0,015 mg/kg

DNEL : End Use: Consumers
Routes of exposure: Inhalation
Potential health effects: Long-term systemic effects

Value: 0,3 mg/m3

| | | |
|---|---|---|
| PNEC | : | Fresh water<br>Value: 0,1 mg/l |
| PNEC | : | Marine water<br>Value: 0,01 mg/l |
| PNEC | : | Fresh water sediment<br>Value: 0,39 mg/kg |
| PNEC | : | Marine sediment<br>Value: 0,039 mg/kg |
| PNEC | : | Soil<br>Value: 0,02 mg/kg |

**8.2**

**Exposure controls**
**Engineering measures**

Adequate ventilation to control airborned concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

**Personal protective equipment**

| | | |
|---|---|---|
| Respiratory protection | : | If ventilation or other engineering controls are not adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure, a supplied-air NIOSH approved respirator may be appropriate. If exposure to harmful levels of airborne material may occur, a NIOSH approved respirator that provides protection may be appropriate, such as:. A positive pressure, air-supplying respirator may be appropriate if there is potential for uncontrolled release, aerosolization, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection. |
| Hand protection | : | The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. |
| Eye protection | : | Eye wash bottle with pure water. Tightly fitting safety goggles. |
| Skin and body protection | : | Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Protective suit. Safety shoes. |

| | | |
|---|---|---|
| Hygiene measures | : | When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday. |

## SECTION 9: Physical and chemical properties

**9.1**

**Information on basic physical and chemical properties**

**Appearance**

| | | |
|---|---|---|
| Form | : | liquid |
| Physical state | : | liquid |
| Color | : | Clear |
| Odor | : | Mild |

**Safety data**

| | | |
|---|---|---|
| Flash point | : | 166°C (331°F)<br>Method: closed cup |
| Lower explosion limit | : | No data available |
| Upper explosion limit | : | No data available |
| Oxidizing properties | : | No |
| Autoignition temperature | : | No data available |
| Molecular formula | : | C4H8SO2 |
| Molecular weight | : | 120,18 g/mol |
| pH | : | Not applicable |
| Freezing point | : | 26°C (79°F) |
| Pour point | | No data available |
| Boiling point/boiling range | : | 282-288°C (540-550°F) |
| Vapor pressure | : | 1,14 MMHG<br>at 37,8°C (100,0°F) |
| Relative density | : | 1,26<br>at 30 °C (86 °F) |
| Density | : | 1,26 G/ML |
| Water solubility | : | Miscible |
| Partition coefficient: n-octanol/water | : | log Pow: 0<br>at 20°C (68°F) |
| Viscosity, kinematic | : | No data available |
| Relative vapor density | : | 3<br>(Air = 1.0) |

Evaporation rate : 1

Percent volatile : > 99 %

**9.2**

**Other information**

Conductivity : No data available

## SECTION 10: Stability and reactivity

**10.1**

**Reactivity** : Stable under recommended storage conditions.

**10.2**

**Chemical stability** : This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**10.3**

**Possibility of hazardous reactions**

**Hazardous reactions** : Hazardous reactions: Hazardous polymerization does not occur.

**10.4**

**Conditions to avoid** : No data available.

**10.5**

**Materials to avoid** : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

**10.6**

**Hazardous decomposition products** : Carbon oxides
Sulfur oxides

**Other data** : No decomposition if stored and applied as directed.

## SECTION 11: Toxicological information

**11.1**

**Information on toxicological effects**

**Acute oral toxicity**

Sulfolane : LD50: 2.068 mg/kg
Species: Rat
Sex: male and female
Method: OECD Test Guideline 401

**Acute inhalation toxicity**

| | | |
|---|---|---|
| Sulfolane | : | LC50: > 12000 mg/m3Exposure time: 4 h<br>Species: Rat<br>Sex: male and female<br>Test atmosphere: vapor<br>An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration. |

**Acute dermal toxicity**

| | | |
|---|---|---|
| Sulfolane | : | LD50: > 2.000 mg/kg<br>Species: Rat<br>Method: Directive 67/548/EEC, Annex V, B.3. |

**Skin irritation**

| | | |
|---|---|---|
| Sulfolane | : | No skin irritation |

**Eye irritation**

| | | |
|---|---|---|
| Sulfolane | : | No eye irritation |

**Sensitization**

| | | |
|---|---|---|
| Sulfolane | : | Did not cause sensitization on laboratory animals. |

**Repeated dose toxicity**

| | | |
|---|---|---|
| Sulfolane | : | Species: Rat, Male and female<br>Sex: Male and female<br>Application Route: Oral<br>Dose: 60, 200, 700 mg/kg bw/day<br>Exposure time: 28 d<br>Number of exposures: Daily<br>NOEL: 200 mg/kg bw/day<br>Lowest observable effect level: 700 mg/kg bw/day |

Species: Rat
Application Route: Inhalation
Dose: 2.8, 4.0, 20 mg/m3
Exposure time: 90-110 days
Number of exposures: 23 hrs/d, 7d/wk
NOEL: 20 mg/m3

Species: Guinea pig
Application Route: Inhalation
Dose: 4.0, 20, 159, 200 mg/m3
Exposure time: 90-110 days
Number of exposures: 23 hrs/d, 7 d/wk
NOEL: 159 mg/m3
Target Organs: Lungs, Blood, Liver

Species: Rat, male
Sex: male
Application Route: Oral diet
Dose: 2.1, 8.8, 35, 131.7 mg/kg/d
Exposure time: 13 wk
Number of exposures: Daily
NOEL: 8,8 mg/kg
Method: OECD Test Guideline 408
Target Organs: Kidney

Species: Rat, female
Sex: female
Application Route: Oral diet
Dose: 2.9, 10.6, 42, 191.1 mg/kg/d
Exposure time: 13 wk
Number of exposures: Daily
NOEL: 2,9 mg/kg
Method: OECD Test Guideline 408
Target Organs: Immune system

**Genotoxicity in vitro**

Sulfolane : Test Type: Ames test
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: Mouse lymphoma assay
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Test Type: Sister Chromatid Exchange Assay
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: Chromosome aberration test in vitro
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Test Type: Mouse lymphoma assay
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 490
Result: negative

**Reproductive toxicity**

Sulfolane : Species: Rat
Sex: female
Application Route: oral gavage
Dose: 60, 200, 700 mg/kg
Number of exposures: Daily
Test period: 2 wk premating to lactation D4
Method: OECD Guideline 421
NOAEL Parent: 200 mg/kg bw/day
NOAEL F1: 60 mg/kg bw/day
Decrease birth index and number of pups

**Developmental Toxicity**

Sulfolane : Species: Rat
Application Route: oral gavage
Dose: 60, 200, 700 mg/kg
Number of exposures: Daily
Test period: 2 wk premating to lactation D4
NOAEL Teratogenicity: 60 mg/kg bw/day
NOAEL Maternal: 200 mg/kg bw/day

Species: Rat
Application Route: oral gavage
Dose: 100, 200, 500 mg/kg/day
Number of exposures: Daily
Test period: GD 1 - 19
NOAEL Teratogenicity: 200 mg/kg
NOAEL Maternal: 100 mg/kg
May damage the unborn child.

**Sulfolane - A Anhydrous**
**Aspiration toxicity** : No aspiration toxicity classification.

**CMR effects**

| | | |
|---|---|---|
| Sulfolane | : | Carcinogenicity: Not available<br>Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.<br>Reproductive toxicity: Clear evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments |

**11.2**

**Information on other hazards**

**Sulfolane - A Anhydrous**

| | | |
|---|---|---|
| **Further information** | : | No data available. |
| Endocrine disrupting properties | : | 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 12: Ecological information

**12.1**

**Toxicity**

**Toxicity to fish**

| | | |
|---|---|---|
| Sulfolane | : | LC50: > 100 mg/l<br>Exposure time: 96 h<br>Species: Oryzias latipes (Orange-red killifish)<br>static test Method: OECD Test Guideline 203 |

**Toxicity to daphnia and other aquatic invertebrates**

| | | |
|---|---|---|
| Sulfolane | : | EC50: 852 mg/l<br>Exposure time: 48 h<br>Species: Daphnia magna (Water flea)<br>static test Method: OECD Test Guideline 202 |

**Toxicity to algae**

| | | |
|---|---|---|
| Sulfolane | : | EC50: 500 mg/l<br>Exposure time: 72 h<br>Species: Pseudokirchneriella subcapitata (green algae)<br>Method: OECD Test Guideline 201<br><br>NOEC: 171 mg/l<br>Exposure time: 72 h<br>Species: Pseudokirchneriella subcapitata (green algae)<br>Method: OECD Test Guideline 201 |

**12.2**

**Persistence and degradability**

Biodegradability

| | | |
|---|---|---|
| Sulfolane | : | Result: Not readily biodegradable. |

10,1 %
Testing period: 14 d
Method: OECD Test Guideline 301C

**12.3**
**Bioaccumulative potential**

Bioaccumulation

| | | |
|---|---|---|
| Sulfolane | : | Species: Cyprinus carpio (Carp)<br>Bioconcentration factor (BCF): < 1,3<br>This material is not expected to bioaccumulate. |

**12.4**
**Mobility in soil**

Mobility

| | | |
|---|---|---|
| Sulfolane | : | Groundwater contamination is possible. |

**12.5**
**Results of PBT and vPvB assessment**

| | | |
|---|---|---|
| Results of PBT 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**

| | | |
|---|---|---|
| Endocrine disrupting properties | : | 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**

| | | |
|---|---|---|
| Additional ecological information | : | This material is not expected to be harmful to aquatic organisms. |

**12.8**
**Additional Information**

**Ecotoxicology Assessment**

| | | |
|---|---|---|
| Short-term (acute) aquatic hazard | : | This material is not expected to be harmful to aquatic organisms. |
| Long-term (chronic) aquatic hazard | : | This material is not expected to be harmful to aquatic organisms. |

## SECTION 13: Disposal considerations

**13.1**
**Waste treatment methods**
The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

| | | |
|---|---|---|
| Product | : | Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company. |
| Contaminated packaging | : | Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. |

## SECTION 14: Transport information

**14.1 - 14.7**

**Transport information**

**The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).**

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

**US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)**

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**Maritime transport in bulk according to IMO instruments**

## SECTION 15: Regulatory information

**15.1**

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

Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

**Water hazard class (Germany)** : WGK 2 water endangering

**15.2**

**Chemical Safety Assessment**

| | | | | |
|---|---|---|---|---|
| **Components** | : | tetrahydrothiophene 1,1-dioxide | A Chemical Safety Assessment has been carried out for this substance. | 204-783-1 |

**Major Accident Hazard Legislation** : 96/82/EC Update: 2003
Directive 96/82/EC does not apply

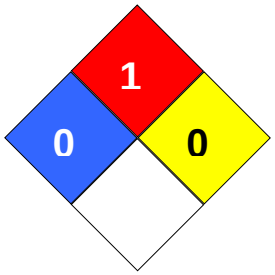
: ZEU_SEVES3 Update:
Not applicable

**Notification status**

| | | |
|---|---|---|
| Europe REACH | : | This product is in full compliance according to REACH regulation 1907/2006/EC. |
| Switzerland CH INV | : | On the inventory, or in compliance with the inventory |
| United States of America (USA) TSCA | : | On or in compliance with the active portion of the TSCA inventory |
| Canada DSL | : | All components of this product are on the Canadian DSL |
| Australia AIIC | : | On the inventory, or in compliance with the inventory |
| New Zealand NZIoC | : | On the inventory, or in compliance with the inventory |
| Japan ENCS | : | On the inventory, or in compliance with the inventory |
| Korea KECI | : | All substances in this product were registered, notified to be registered, or exempted from registration by CPChem through an Only Representative according to K-REACH regulations. Importation of this product is permitted if the Korean Importer of Record was included on CPChem's notifications or if the Importer of Record themselves notified the substances. |
| Philippines PICCS | : | On the inventory, or in compliance with the inventory |
| Taiwan TCSI | : | On the inventory, or in compliance with the inventory |
| China IECSC | : | On the inventory, or in compliance with the inventory |

## SECTION 16: Other information

**NFPA Classification** : Health Hazard: 0
Fire Hazard: 1
Reactivity Hazard: 0




**Further information**

Legacy SDS Number : 34190

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

| Key or legend to abbreviations and acronyms used in the safety data sheet | | | |
|---|---|---|---|
| ACGIH | American Conference of Government Industrial Hygienists | LD50 | Lethal Dose 50% |
| AIIC | Australian Inventory of Industrial Chemicals | LOAEL | Lowest Observed Adverse Effect Level |
| DSL | Canada, Domestic Substances List | NFPA | National Fire Protection Agency |
| NDSL | Canada, Non-Domestic Substances List | NIOSH | National Institute for Occupational Safety & Health |
| CNS | Central Nervous System | NTP | National Toxicology Program |
| CAS | Chemical Abstract Service | NZIoC | New Zealand Inventory of Chemicals |
| EC50 | Effective Concentration | NOAEL | No Observable Adverse Effect Level |
| EC50 | Effective Concentration 50% | NOEC | No Observed Effect Concentration |
| EGEST | EOSCA Generic Exposure Scenario Tool | OSHA | Occupational Safety & Health Administration |
| EOSCA | European Oilfield Specialty Chemicals Association | PEL | Permissible Exposure Limit |
| EINECS | European Inventory of Existing Chemical Substances | PICCS | Philippines Inventory of Commercial Chemical Substances |
| MAK | Germany Maximum Concentration Values | PRNT | Presumed Not Toxic |
| GHS | Globally Harmonized System | RCRA | Resource Conservation Recovery Act |
| >= | Greater Than or Equal To | STEL | Short-term Exposure Limit |
| IC50 | Inhibition Concentration 50% | SARA | Superfund Amendments and Reauthorization Act. |
| IARC | International Agency for Research on Cancer | TLV | Threshold Limit Value |
| IECSC | Inventory of Existing Chemical Substances in China | TWA | Time Weighted Average |
| ENCS | Japan, Inventory of Existing and | TSCA | Toxic Substance Control Act |

| | | | |
|---|---|---|---|
| | New Chemical Substances | | |
| KECI | Korea, Existing Chemical Inventory | UVCB | Unknown or Variable Composition, Complex Reaction Products, and Biological Materials |
| <= | Less Than or Equal To | WHMIS | Workplace Hazardous Materials Information System |
| LC50 | Lethal Concentration 50% | ATE | Acute toxicity estimate |

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

| | |
|---|---|
| H302 | Harmful if swallowed. |
| H360 | May damage fertility or the unborn child. |

**Annex**

1. Short title of Exposure Scenario: **Use as an aromatics extraction solvent - industrial**

| | | |
|---|---|---|
| Main User Groups | : | **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Sector of use | : | **SU8, SU9:** Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals |
| Process category | : | **PROC1:** Use in closed process, no likelihood of exposure<br>**PROC2:** Use in closed, continuous process with occasional controlled exposure<br>**PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br>**PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities<br>**PROC15:** Use as laboratory reagent |
| Environmental release category | : | **ERC1, ERC4, ERC6a:** Manufacture of substances, 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) |
| Further information | : | Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities |

**2.1 Contributing scenario controlling environmental exposure for:ERC1, ERC4, ERC6a: Manufacture of substances, 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)**

**Product characteristics**

| | | |
|---|---|---|
| Viscosity, dynamic | : | 10,34 mPa.s at 30 °C |
| (Msafe) | : | 200 kg/day |

**Environment factors not influenced by risk management**

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

**Other given operational conditions affecting environmental exposure**

| | | |
|---|---|---|
| Number of emission days per year | : | 300 |
| Emission or Release Factor: Air | : | 0,001 % |
| Emission or Release Factor: Water | : | 1 % |
| Emission or Release Factor: Soil | : | 0,01 % |

**Technical conditions and measures / Organizational measures**

| | | |
|---|---|---|
| Air | : | Treat air emission to provide a typical removal efficiency of |

(%): (Effectiveness: > 90 %)

| | | |
|---|---|---|
| Remarks | : | Prevent environmental discharge consistent with regulatory requirements. |
| Water | : | No onsite wastewater treatment prior to discharge to sewage treatment plant. |

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

| | | |
|---|---|---|
| Type of Sewage Treatment Plant | : | Municipal sewage treatment plant |
| Percentage removed from waste water | : | 0 % |
| Procedures to limit air emissions from Sewage Treatment Plant | : | No data available |
| Remarks | : | Domestic sewage treatment is not assumed. |

**Conditions and measures related to external treatment of waste for disposal**

| | | |
|---|---|---|
| Waste treatment | : | External treatment and disposal of waste should comply with applicable local and/or national regulations. |

**Conditions and measures related to external recovery of waste**

| | | |
|---|---|---|
| Recovery Methods | : | External recovery and recycling of waste should comply with applicable local and/or national regulations. |

## 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use as laboratory reagent

**Product characteristics**

| | | |
|---|---|---|
| Physical Form (at time of use) | : | Liquid substance |
| Vapor pressure | : | > 0,5 kPa |

**Amount used**

| | | |
|---|---|---|
| Remarks | : | Not applicable |

**Frequency and duration of use**

| | | |
|---|---|---|
| Remarks | : | Covers daily exposures up to 8 hours (unless stated differently) |

**Other operational conditions affecting workers exposure**

| | | |
|---|---|---|
| Remarks | : | Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently. |

## 2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

**Product characteristics**

| | | |
|---|---|---|
| Physical Form (at time of use) | : | Liquid substance |
| Vapor pressure | : | > 0,5 kPa |

**Amount used**

| | | |
|---|---|---|
| Remarks | : | Not applicable |

**Frequency and duration of use**

| | | |
|---|---|---|
| Remarks | : | Covers daily exposures up to 8 hours (unless stated differently) |

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**
Provide enhanced general ventilation by mechanical means.

**Conditions and measures related to personal protection, hygiene and health evaluation**
Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.

## 2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

**Product characteristics**
Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**
Remarks : Not applicable

**Frequency and duration of use**
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**
Provide enhanced general ventilation by mechanical means.

**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 type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|---|---|---|---|---|---|---|
| ERC1, ERC4, ERC6a | EUSES | | Freshwater | | 0,0893 mg/L | 0,9 |
| | | | Marine water | | 0,00894 mg/L | 0,9 |
| | | | Freshwater sediment | | 0,0764 mg/kg | 0,9 |
| | | | Marine sediment | | 0,00764 mg/kg | 0,9 |
| | | | Soil | | 0,00149 mg/kg | 0,083 |

ERC1: Manufacture of substances
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

**Workers/Consumers**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|---|---|---|---|---|---|
| **PROC1, CS15** | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,01 ppm | 0,0 |
| | | | Worker – dermal, long-term – systemic | 0,34 mg/kg/d | 0,1 |
| | | | Worker – long-term – systemic Combined routes | | 0,10 |
| PROC2, CS15, CS67 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,70 ppm | 0,4 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,77 |
| PROC15, CS36 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,30 ppm | 0,2 |
| | | | Worker – dermal, long-term – systemic | 0,34 mg/kg/d | 0,1 |
| | | | Worker – long-term – systemic Combined routes | | 0,26 |
| PROC8a, CS39 | ECETOC TRA | | Worker – inhalation, long-term – systemic | 0,21 ppm | 0,1 |
| | | | Worker – dermal, long-term – systemic | 2,74 mg/kg/d | 0,8 |
| | | | Worker – long-term – systemic Combined routes | | 0,90 |
| PROC8b, CS14, CS39 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 1,05 ppm | 0,6 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,97 |

PROC1: Use in closed process, no likelihood of exposure
CS15: General exposures (closed systems)

PROC2: Use in closed, continuous process with occasional controlled exposure
CS15: General exposures (closed systems)
CS67: Storage

PROC15: Use as laboratory reagent
CS36: Laboratory activities

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
CS39: Equipment cleaning and maintenance

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS14: Bulk transfers
CS39: Equipment cleaning and maintenance

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

Confirm that RMMs and OCs are as described or of equivalent efficiency.
When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1Confirm that RMMs and OCs are as described or of equivalent efficiency.
When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1

1. Short title of Exposure Scenario: **Use in acid gas purification – industrial**

| | | |
|---|---|---|
| Main User Groups | : | **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Sector of use | : | **SU8, SU9:** Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals |
| Process category | : | **PROC1:** Use in closed process, no likelihood of exposure<br>**PROC2:** Use in closed, continuous process with occasional controlled exposure<br>**PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br>**PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities<br>**PROC15:** Use as laboratory reagent |
| Environmental release category | : | **ERC1, ERC4, ERC6a:** Manufacture of substances, 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) |
| Further information | : | Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities |

**2.1 Contributing scenario controlling environmental exposure for:ERC1, ERC4, ERC6a: Manufacture of substances, 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)**

**Product characteristics**

| | | |
|---|---|---|
| Viscosity, dynamic | : | 10,34 mPa.s at 30 °C |
| (Msafe) | : | 200 kg/day |

**Environment factors not influenced by risk management**

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

**Other given operational conditions affecting environmental exposure**

| | | |
|---|---|---|
| Number of emission days per year | : | 300 |
| Emission or Release Factor: Air | : | 0,001 % |
| Emission or Release Factor: Water | : | 1 % |

Emission or Release Factor: Soil : 0,01 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: > 90 %)

Remarks : Prevent environmental discharge consistent with regulatory requirements.

Water : No onsite wastewater treatment prior to discharge to sewage treatment plant.

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

Type of Sewage Treatment Plant : Municipal sewage treatment plant

Percentage removed from waste water : 0 %

Procedures to limit air emissions from Sewage Treatment Plant : No data available

Remarks : Domestic sewage treatment is not assumed.

**Conditions and measures related to external treatment of waste for disposal**

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

**Conditions and measures related to external recovery of waste**

Recovery Methods : External recovery and recycling of waste should comply with applicable local and/or national regulations.

## 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use as laboratory reagent

**Product characteristics**

Physical Form (at time of use) : Liquid substance

Vapor pressure : > 0,5 kPa

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

## 2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

**Product characteristics**

Physical Form (at time of use) : Liquid substance

Vapor pressure : > 0,5 kPa

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

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

Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.

## 2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

**Product characteristics**

Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

**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 type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|---|---|---|---|---|---|---|
| ERC1, ERC4, ERC6a | EUSES | | Freshwater | | 0,0893 mg/L | 0,9 |
| | | | Marine water | | 0,00894 mg/L | 0,9 |
| | | | Freshwater sediment | | 0,0764 mg/kg | 0,9 |
| | | | Marine sediment | | 0,00764 mg/kg | 0,9 |
| | | | Soil | | 0,00149 mg/kg | 0,083 |

ERC1: Manufacture of substances

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

**Workers/Consumers**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|---|---|---|---|---|---|
| **PROC1, CS15** | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,01 ppm | 0,0 |
| | | | Worker – dermal, long-term – systemic | 0,34 mg/kg/d | 0,1 |
| | | | Worker – long-term – systemic Combined routes | | 0,10 |
| PROC2, CS15, CS67 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,70 ppm | 0,4 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,77 |
| PROC15, CS36 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,30 ppm | 0,2 |
| | | | Worker – dermal, long-term – systemic | 0,34 mg/kg/d | 0,1 |
| | | | Worker – long-term – systemic Combined routes | | 0,26 |
| PROC8a, CS39 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,21 ppm | 0,1 |
| | | | Worker – dermal, long-term – systemic | 2,74 mg/kg/d | 0,8 |
| | | | Worker – long-term – systemic Combined routes | | 0,90 |
| PROC8b, CS14, CS39 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 1,05 ppm | 0,6 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,97 |

PROC1: Use in closed process, no likelihood of exposure
CS15: General exposures (closed systems)

PROC2: Use in closed, continuous process with occasional controlled exposure
CS15: General exposures (closed systems)
CS67: Storage

PROC15: Use as laboratory reagent
CS36: Laboratory activities

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
CS39: Equipment cleaning and maintenance

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS14: Bulk transfers
CS39: Equipment cleaning and maintenance

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

Confirm that RMMs and OCs are as described or of equivalent efficiency.
When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1

1. Short title of Exposure Scenario: **Formulation**

| | | |
|---|---|---|
| Main User Groups | : | **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Sector of use | : | **SU 10:** Formulation [mixing] of preparations and/ or re-packaging (excluding alloys) |
| Process category | : | **PROC1:** Use in closed process, no likelihood of exposure<br>**PROC2:** Use in closed, continuous process with occasional controlled exposure<br>**PROC3:** Use in closed batch process (synthesis or formulation)<br>**PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises<br>**:** PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)<br>**PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br>**PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities<br>**PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing)<br>**PROC14:** Production of preparations or articles by tabletting, compression, extrusion, pelletization<br>**PROC15:** Use as laboratory reagent |
| Environmental release category | : | **ERC2:** Formulation of preparations |
| Further information | : | Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities. |

## 2.1 Contributing scenario controlling environmental exposure for:ERC2: Formulation of preparations

**Product characteristics**

| | | |
|---|---|---|
| Viscosity, dynamic | : | 10,34 mPa.s at 30 °C |
| Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (tonnes/day): (Msafe) | : | |
| Remarks | : | Not applicable |

**Technical conditions and measures / Organizational measures**
Remarks : Not applicable

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use as laboratory reagent**

**Product characteristics**
Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**
Remarks : Not applicable

**Frequency and duration of use**
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)**

**Product characteristics**
Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**
Remarks : Not applicable

**Frequency and duration of use**
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**
Provide enhanced general ventilation by mechanical means.

**2.2 Contributing scenario controlling worker exposure for: PROC4, PROC8b, PROC9, PROC14: Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Production of preparations or**

**articles by tabletting, compression, extrusion, pelletization**

**Product characteristics**
Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**
Remarks : Not applicable

**Frequency and duration of use**
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**
Provide enhanced general ventilation by mechanical means.

**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.

## 2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

**Product characteristics**
Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**
Remarks : Not applicable

**Frequency and duration of use**
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**
Ensure material transfers are under containment or extract ventilation.

**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 chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.

## 3. Exposure estimation and reference to its source

**Workers/Consumers**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|---|---|---|---|---|---|
| **PROC1, CS15** | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,01 ppm | 0,0 |
| | | | Worker – dermal, long-term – systemic | 0,34 mg/kg/d | 0,1 |
| | | | Worker – long-term – systemic Combined routes | | 0,10 |
| PROC2, CS15 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 1,00 ppm | 0,5 |
| | | | Worker – dermal, long-term – systemic | 1,34 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,93 |
| PROC15, CS36 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 1,5 ppm | 0,8 |
| | | | Worker – dermal, long-term – systemic | 0,34 mg/kg/d | 0,1 |
| | | | Worker – long-term – systemic Combined routes | | 0,92 |
| PROC3, CS15 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,90 ppm | 0,5 |
| | | | Worker – dermal, long-term – systemic | 0,34 mg/kg/d | 0,1 |
| | | | Worker – long-term – systemic Combined routes | | 0,59 |
| PROC4, CS55 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,90 ppm | 0,5 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,88 |
| PROC8b, CS14 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,90 ppm | 0,5 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,88 |
| PROC9, CS4 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,90 ppm | 0,5 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,88 |
| PROC14, CS4 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,90 ppm | 0,5 |
| | | | Worker – dermal, long-term – systemic | 0,69 mg/kg/d | 0,2 |
| | | | Worker – long-term – systemic Combined routes | | 0,69 |
| PROC8a, CS14 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,84 ppm | 0,5 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined | | 0,85 |

| | | | routes | | |
|---|---|---|---|---|---|

PROC1: Use in closed process, no likelihood of exposure
CS15: General exposures (closed systems)

PROC2: Use in closed, continuous process with occasional controlled exposure
CS15: General exposures (closed systems)

PROC15: Use as laboratory reagent
CS36: Laboratory activities

PROC3: Use in closed batch process (synthesis or formulation)
CS15: General exposures (closed systems)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
CS55: Batch process

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS14: Bulk transfers

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
CS4: Dipping, immersion and pouring

PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelletization
CS4: Dipping, immersion and pouring

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
CS14: Bulk transfers

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

Confirm that RMMs and OCs are as described or of equivalent efficiency.
When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1

1. Short title of Exposure Scenario: **Use as a cleaning agent – industrial**

| | | |
|---|---|---|
| Main User Groups | : | **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Sector of use | : | **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Process category | : | **PROC1:** Use in closed process, no likelihood of exposure<br>**PROC2:** Use in closed, continuous process with occasional controlled exposure<br>**PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises<br>**PROC7:** Industrial spraying<br>**PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities<br>**PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities<br>**PROC10:** Roller application or brushing |

| | | |
|---|---|---|
| | | **PROC13:** Treatment of articles by dipping and pouring |
| Environmental release category | : | **ERC4:** Industrial use of processing aids in processes and products, not becoming part of articles |
| Further information | : | Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. Exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance. |

## 2.1 Contributing scenario controlling environmental exposure for:ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**Product characteristics**

| | | |
|---|---|---|
| Viscosity, dynamic | : | 10,34 mPa.s at 30 °C |
| (Msafe) | : | 396 kg/day |

**Environment factors not influenced by risk management**

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

**Other given operational conditions affecting environmental exposure**

| | | |
|---|---|---|
| Number of emission days per year | : | 300 |
| Emission or Release Factor: Air | : | 30 % |
| Emission or Release Factor: Water | : | 0,01 % |
| Emission or Release Factor: Soil | : | 0 % |

**Technical conditions and measures / Organizational measures**

| | | |
|---|---|---|
| Air | : | Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: > 70 %) |
| Remarks | : | Prevent environmental discharge consistent with regulatory requirements. |
| Water | : | No onsite wastewater treatment prior to discharge to sewage treatment plant. |

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

| | | |
|---|---|---|
| Type of Sewage Treatment Plant | : | Municipal sewage treatment plant |
| Percentage removed from waste water | : | 0 % |
| Procedures to limit air emissions from Sewage Treatment Plant | : | No data available |
| Remarks | : | Domestic sewage treatment is not assumed. |

**Conditions and measures related to external treatment of waste for disposal**

| | | |
|---|---|---|
| Waste treatment | : | External treatment and disposal of waste should comply with applicable local and/or national regulations. |

**Conditions and measures related to external recovery of waste**

| | | |
|---|---|---|
| Recovery Methods | : | External recovery and recycling of waste should comply with applicable local and/or national regulations. |

## 2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2: Use in

**closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure**

**Product characteristics**
Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**
Remarks : Not applicable

**Frequency and duration of use**
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**
Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.

## 2.2 Contributing scenario controlling worker exposure for: PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises

**Product characteristics**
Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**
Remarks : Not applicable

**Frequency and duration of use**
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**
Provide enhanced general ventilation by mechanical means.

**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 chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.

## 2.2 Contributing scenario controlling worker exposure for: PROC7: Industrial spraying

**Product characteristics**
Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**
Remarks : Not applicable

**Frequency and duration of use**
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**
Ensure material transfers are under containment or extract ventilation.

**Conditions and measures related to personal protection, hygiene and health evaluation**
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.
Wear a full face respirator conforming to EN140 with Type A filter or better.

## 2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

**Product characteristics**
Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**
Remarks : Not applicable

**Frequency and duration of use**
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**
Provide enhanced general ventilation by mechanical means.

**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.

## 2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC10, PROC13: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Roller application or brushing, Treatment of articles by dipping and pouring

**Product characteristics**

Physical Form (at time of use) : Liquid substance
Vapor pressure : > 0,5 kPa

**Amount used**
Remarks : Not applicable

**Frequency and duration of use**
Remarks : Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**
Remarks : Assumes a good basic standard of occupational hygiene is implemented., Assumes use at not more than 20°C above ambient temperature, unless stated differently.

**Technical conditions and measures**
Ensure material transfers are under containment or extract ventilation.

**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 chemically resistant gloves (tested to EN374) in combination with specific activity training.

## 3. Exposure estimation and reference to its source

**Environment**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Compartment | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|---|---|---|---|---|---|---|
| ERC4 | EUSES | | Freshwater | | 0,00137 mg/L | 0,014 |
| | | | Marine water | | 0,000136 mg/L | 0,014 |
| | | | Freshwater sediment | | 0,00117 mg/kg | 0,014 |
| | | | Marine sediment | | 0,000116 mg/kg | 0,014 |
| | | | Soil | | 0,00794 mg/kg | 0,45 |

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

**Workers/Consumers**

| Contributing Scenario | Exposure Assessment Method | Specific conditions | Value type | Level of Exposure | Risk characterization ratio (PEC/PNEC): |
|---|---|---|---|---|---|
| **PROC1, CS15** | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,01 ppm | 0,0 |
| | | | Worker – dermal, long-term – systemic | 0,34 mg/kg/d | 0,1 |
| | | | Worker – long-term – systemic Combined routes | | 0,10 |
| PROC2, CS15 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 1,00 ppm | 0,5 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,94 |

| | | | | | |
|---|---|---|---|---|---|
| PROC4, CS55 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,90 ppm | 0,5 |
| | | | Worker – dermal, long-term – systemic | 0,69 mg/kg/d | 0,2 |
| | | | Worker – long-term – systemic Combined routes | | 0,69 |
| PROC7, CS10 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,60 ppm | 0,3 |
| | | | Worker – dermal, long-term – systemic | 2,14 mg/kg/d | 0,6 |
| | | | Worker – long-term – systemic Combined routes | | 0,94 |
| PROC8b, CS14 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,90 ppm | 0,5 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,88 |
| PROC8a, CS14 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 1,20 ppm | 0,7 |
| | | | Worker – dermal, long-term – systemic | 0,69 mg/kg/d | 0,2 |
| | | | Worker – long-term – systemic Combined routes | | 0,85 |
| PROC10, CS51 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 0,60 ppm | 0,3 |
| | | | Worker – dermal, long-term – systemic | 1,37 mg/kg/d | 0,4 |
| | | | Worker – long-term – systemic Combined routes | | 0,72 |
| PROC13, CS4 | ECETOC TRA Modified | | Worker – inhalation, long-term – systemic | 1,20 ppm | 0,7 |
| | | | Worker – dermal, long-term – systemic | 0,69 mg/kg/d | 0,2 |
| | | | Worker – long-term – systemic Combined routes | | 0,85 |

PROC1: Use in closed process, no likelihood of exposure
CS15: General exposures (closed systems)

PROC2: Use in closed, continuous process with occasional controlled exposure
CS15: General exposures (closed systems)

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
CS55: Batch process

PROC7: Industrial spraying
CS10: Spraying

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS14: Bulk transfers

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
CS14: Bulk transfers

PROC10: Roller application or brushing
CS51: Rolling, Brushing

PROC13: Treatment of articles by dipping and pouring
CS4: Dipping, immersion and pouring

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

Confirm that RMMs and OCs are as described or of equivalent efficiency.
When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1