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

Product information

Product Name: Sulfole® 120B Mercaptan
Material: 1116064, 1108796, 1105436, 1101538, 1101537

EC-No. Registration number

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Legal Entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>tert-Dodecanethiol</td>
<td>25103-58-6</td>
<td>246-619-1</td>
<td>Chevron Phillips Chemicals International N.V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>01-2119486132-42-0002</td>
</tr>
</tbody>
</table>

Relevant Identified Uses Supported: Manufacture
Formulation
Use in polymer processing – industrial
Lubricants - Industrial
Use in mining – industrial

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

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

SDS Requests: (800) 852-5530
Technical Information: (832) 813-4862
Responsible Party: Product Safety Group
Email: sds@cpchem.com

Emergency telephone:

Health: 866.442.9628 (North America)
Sulfol® 120B Mercaptan

Version 5.6

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
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
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

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

SECTION 2: Hazards identification

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

Skin irritation, Category 2
H315: Causes skin irritation.

Eye irritation, Category 2
H319: Causes serious eye irritation.

Skin sensitization, Category 1
H317: May cause an allergic skin reaction.

Chronic aquatic toxicity, Category 4
H413: May cause long lasting harmful effects to aquatic life.

Label elements
Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms:

Signal Word: Warning

Hazard Statements:
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H413: May cause long lasting harmful effects to aquatic life.

Precautionary Statements:
Prevention:
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.

Response:
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
Hazardous ingredients which must be listed on the label:
- 25103-58-6 tert-Dodecanethiol

SECTION 3: Composition/information on ingredients

Synonyms: TDM
Tertiary Dodecyl Mercaptan

Molecular formula: C12H26S

Mixtures

Hazardous ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. EC-No. Index No.</th>
<th>Classification (REGULATION (EC) No 1272/2008)</th>
<th>Concentration [wt%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>tert-Dodecanethiol</td>
<td>25103-58-6 246-619-1</td>
<td>Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1B; H317 Aquatic Chronic 4; H413</td>
<td>98 - 100</td>
</tr>
</tbody>
</table>

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

SECTION 4: First aid measures

General advice: Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

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

In case of skin contact: If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact: Immediately flush eye(s) with plenty of water. 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. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point: 92 °C (198 °F)
Method: Tag closed cup

Autoignition temperature: No data available
Suitable extinguishing media: Carbon dioxide (CO2).

Unsuitable extinguishing media: High volume water jet.

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

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. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.

Fire and explosion protection: Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

Hazardous decomposition products: Carbon oxides. Sulfur oxides.

SECTION 6: Accidental release measures

Personal precautions: Use personal protective equipment. Ensure adequate ventilation.

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.

Methods for cleaning up: Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

SECTION 7: Handling and storage

Handling

Advice on safe handling: Avoid formation of aerosol. Do not breathe vapors/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion: Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.
SAFETY DATA SHEET
Sulfole® 120B Mercaptan
Version 5.6
Revision Date 2018-03-21

Storage

Requirements for storage areas and containers: No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

SECTION 8: Exposure controls/personal protection

Chevron Phillips Chemical Company LP

Ingredients | Basis | Value | Control parameters | Note |
--- | --- | --- | --- | --- |
tert-Dodecanethiol | Manufacturer | TWA | 0,1 ppm, |

<table>
<thead>
<tr>
<th></th>
<th>DNEL</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>End Use: Workers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Routes of exposure: Inhalation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potential health effects: Long-term systemic effects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Value: 0,5 mg/m3</td>
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<tbody>
<tr>
<td></td>
<td>End Use: Workers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Routes of exposure: Skin contact</td>
<td></td>
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<tr>
<td></td>
<td>Potential health effects: Long-term systemic effects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Value: 1,7 mg/kg</td>
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<tr>
<td></td>
<td>End Use: Workers</td>
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<tr>
<td></td>
<td>Routes of exposure: Skin contact</td>
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<td></td>
<td>Potential health effects: Acute effects</td>
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<td>Value: 0,665 mg/cm2</td>
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<td></td>
<td>End Use: Consumers</td>
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<tr>
<td></td>
<td>Routes of exposure: Inhalation</td>
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<tr>
<td></td>
<td>Potential health effects: Long-term systemic effects</td>
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</tr>
<tr>
<td></td>
<td>Value: 0,09 mg/m3</td>
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</table>

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<tbody>
<tr>
<td></td>
<td>End Use: Consumers</td>
<td></td>
</tr>
<tr>
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<td>Routes of exposure: Ingestion</td>
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</tr>
<tr>
<td></td>
<td>Potential health effects: Long-term systemic effects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Value: 0,08 mg/kg</td>
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<tr>
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<th>PNEC</th>
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<td>Fresh water sediment</td>
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</tr>
<tr>
<td></td>
<td>Value: 3 mg/kg</td>
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<th>PNEC</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Marine sediment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Value: 0,3 mg/kg</td>
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</tbody>
</table>

Engineering measures

Adequate ventilation to control airborne 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 : Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Air-Purifying Respirator for Dusts and Mists. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, 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. Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the 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.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance
Form : Liquid
Physical state : Liquid
Color : Colorless
Odor : Repulsive

Safety data
Flash point : 92 °C (198 °F)
    Method: Tag closed cup
Lower explosion limit : No data available
Upper explosion limit : No data available
Oxidizing properties : no
Autoignition temperature : No data available
Molecular formula        : C12H26S
Molecular weight         : 202.44 g/mol
pH                       : No data available
Pour point               : No data available
Boiling point/boiling range : 234 °C (453 °F)
Vapor pressure           : 4.00 Pa
                        at 24 °C (75 °F)
Relative density         : 0.8664
                        at 16 °C (61 °F)
Density                  : 0.9 g/cm3
Water solubility         : 0.00393 mg/l
                        Method: OECD Test Guideline 105
Partition coefficient: n-octanol/water : No data available
Viscosity, dynamic       : 4 mPa.s
Relative vapor density   : 3
                        (Air = 1.0)
Evaporation rate          : 1
Percent volatile          : > 99 %

SECTION 10: Stability and reactivity

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

Possibility of hazardous reactions

Conditions to avoid       : Heat, flames and sparks.
Materials to avoid        : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous decomposition products : Carbon oxides
                                           Sulfur oxides
Other data                : No decomposition if stored and applied as directed.
SECTION 11: Toxicological information

**Acute oral toxicity**
	tert-Dodecanethiol : LD50: > 2,000 mg/kg  
Species: Rat  
Sex: female  
Method: OECD Test Guideline 423

**Acute inhalation toxicity**
	tert-Dodecanethiol : LC50: > 1.97 milligram per liter  
Exposure time: 4 h  
Species: Rat  
Sex: male and female  
Method: OECD Test Guideline 403  
Information given is based on data obtained from similar substances.

**Acute dermal toxicity**
	tert-Dodecanethiol : LD50: > 2000 mg/kg  
Species: Rat  
Sex: male  
Method: OECD Test Guideline 402  
Information given is based on data obtained from similar substances.

**Skin irritation**
	tert-Dodecanethiol : Skin irritation

**Eye irritation**
	tert-Dodecanethiol : Eye irritation

**Sensitization**
	tert-Dodecanethiol : The product is a skin sensitizer, sub-category 1B.

**Repeated dose toxicity**
	tert-Dodecanethiol : Species: Rat, male  
Sex: male  
Application Route: Inhalation  
Dose: 0, 26, 98 ppm  
Exposure time: 4 wk  
Number of exposures: 6 h/d, 5 d/wk  
Lowest observable effect level: 26 ppm  
Method: OECD Test Guideline 412  
Target Organs: Kidney, Liver
<table>
<thead>
<tr>
<th>Species</th>
<th>Sex</th>
<th>Application Route</th>
<th>Dose</th>
<th>Exposure time</th>
<th>Number of exposures</th>
<th>NOEL</th>
<th>Method</th>
<th>Target Organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat, female</td>
<td>female</td>
<td>Inhalation</td>
<td>0, 26, 98 ppm</td>
<td>4 wk</td>
<td>6 h/d, 5 d/wk</td>
<td>26 ppm</td>
<td>OECD Guideline 412</td>
<td>Liver, Kidney</td>
</tr>
<tr>
<td>Dog, male and female</td>
<td>male and female</td>
<td>Inhalation</td>
<td>0, 25, 106 ppm</td>
<td>4 wk</td>
<td>6 h/d, 5 d/wk</td>
<td>25 ppm</td>
<td>OECD Test Guideline 412</td>
<td>Liver</td>
</tr>
<tr>
<td>Mouse, male and female</td>
<td>male and female</td>
<td>Inhalation</td>
<td>0, 25, 109 ppm</td>
<td>4 wk</td>
<td>6 h/d, 5 d/wk</td>
<td>25 ppm</td>
<td>OECD Test Guideline 412</td>
<td>Liver</td>
</tr>
<tr>
<td>Rat, male</td>
<td>male</td>
<td>oral gavage</td>
<td>10, 50, 250 mg/kg</td>
<td>35 d</td>
<td>once daily</td>
<td>50 mg/kg</td>
<td>OECD Guideline 422</td>
<td>Liver, spleen</td>
</tr>
<tr>
<td>Rat, female</td>
<td>female</td>
<td>oral gavage</td>
<td>10, 50, 250 mg/kg</td>
<td>53 d</td>
<td>once daily</td>
<td>50 mg/kg</td>
<td>OECD Guideline 422</td>
<td>Liver, spleen</td>
</tr>
<tr>
<td>Rat, male</td>
<td>male</td>
<td>Inhalation</td>
<td>5, 25, 100 ppm</td>
<td>90 d</td>
<td></td>
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</tbody>
</table>

Information given is based on data obtained from similar substances.
Reproductive toxicity
tert-Dodecanethiol: Species: Rat
Sex: male
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 35 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: >= 250 mg/kg
Information given is based on data obtained from similar substances.
Species: Rat
Sex: female
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 53 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: 50 mg/kg
NOAEL F1: 50 mg/kg
Information given is based on data obtained from similar substances.
Decrease in Delivery Index

Developmental Toxicity
**tert-Dodecanethiol**

**: Species: Rat  
Application Route: Inhalation  
Dose: 0, 22.7, 88.6 ppm  
Number of exposures: 6 hrs/d  
Test period: GD 6-19  
Method: OECD Guideline 414  
NOAEL Teratogenicity: >= 88.6 ppm  
No adverse effects expected**

**: Species: Mouse  
Application Route: Inhalation  
Dose: 0, 22.7, 88.6 ppm  
Number of exposures: 6 hrs/d  
Test period: GD 6-19  
Method: OECD Guideline 414  
NOAEL Teratogenicity: >= 88.6 ppm  
No adverse effects expected**

**Sulfole® 120B Mercaptan**

**Aspiration toxicity**

**: May be harmful if swallowed and enters airways.**

**CMR effects**

**: Carcinogenicity: Not available  
Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.  
Teratogenicity: Animal testing did not show any effects on fetal development.  
Reproductive toxicity: No toxicity to reproduction**

**Sulfole® 120B Mercaptan**

**Further information**

**: Solvents may degrease the skin.**

**SECTION 12: Ecological information**

**Toxicity to fish**

**: tert-Dodecanethiol  
LL50: > 100 mg/l  
Exposure time: 96 h  
Species: Danio rerio (Zebra Fish)  
static test Method: OECD Test Guideline 203  
No toxicity at the limit of solubility.**

**Toxicity to daphnia and other aquatic invertebrates**

**: tert-Dodecanethiol  
EC50: > 0,056 mg/l  
Exposure time: 48 h  
Species: Daphnia magna (Water flea)  
semi-static test Method: OECD Test Guideline 202  
No toxicity at the limit of solubility.**

**Toxicity to bacteria**

**: tert-Dodecanethiol  
NOEC: 8,6 mg/l**
Sulfole® 120B Mercaptan

Version 5.6

Exposure time: 3 h
Growth rate
Respiration inhibition
Method: OECD Test Guideline 209

NOEC: > 10 mg/l
Exposure time: 3 h
Growth rate
Respiration inhibition
Method: OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

tert-Dodecanethiol : NOEC: 0.0108 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
semi-static test
Method: OECD Test Guideline 211
No toxicity at the limit of solubility.

Elimination information (persistence and degradability)

Bioaccumulation

tert-Dodecanethiol : Species: Danio rerio (zebra fish)
Exposure time: 15 d
Bioconcentration factor (BCF): > 500 - < 1.950
Method: OECD Test Guideline 305
Biomagnification factor <1
The product may be accumulated in organisms.

Biodegradability : This material is not expected to be readily biodegradable.

Ecotoxicology Assessment

Acute aquatic toxicity tert-Dodecanethiol : No toxicity at the limit of solubility.

Chronic aquatic toxicity tert-Dodecanethiol : May cause long lasting harmful effects to aquatic life.

Toxicity Data on Soil tert-Dodecanethiol : Adsorbs on soil.

Results of PBT assessment tert-Dodecanethiol : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information : May cause long-term adverse effects in the aquatic environment.

SECTION 13: Disposal considerations

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

SDS Number: 100000014573 12/46
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**

The product should not be allowed to enter drains, water courses or the soil. 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. Do not burn, or use a cutting torch on, the empty drum.

For additional details, see the Exposure Scenario in the Annex portion.

### SECTION 14: 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)**

NA1993, COMBUSTIBLE LIQUID, N.O.S., (TERTIARY DODECANETHIOL), III

**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)**

UN3334, AVIATION REGULATED LIQUID, N.O.S., (TERTIARY DODECANETHIOL), 9, III

**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.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

**SECTION 15: Regulatory information**

**National legislation**

**Chemical Safety Assessment**

**Ingredients** : tert-dodecanethiol  
A Chemical Safety Assessment is 246-619-1 not required for this substance.

**Major Accident Hazard Legislation** : 96/82/EC  Update: 2003  
Dangerous for the environment  
9a  
Quantity 1: 100 t  
Quantity 2: 200 t

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

**Notification status**

Europe REACH : On the inventory, or in compliance with the inventory  
United States of America (USA) : On the inventory, or in compliance with the inventory  
TSCA : On the inventory, or in compliance with the inventory  
Canada DSL : On the inventory, or in compliance with the inventory  
Australia AICS : 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 : On the inventory, or in compliance with the inventory  
Philippines PICCS : 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: 2  
Fire Hazard: 2  
Reactivity Hazard: 0

**Further information**

Legacy SDS Number : CPC00490

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

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACGIH</td>
<td>American Conference of Government Industrial Hygienists</td>
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<tr>
<td>LD50</td>
<td>Lethal Dose 50%</td>
</tr>
<tr>
<td>LOAEL</td>
<td>Lowest Observed Adverse Effect Level</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Agency</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety &amp; Health</td>
</tr>
<tr>
<td>NTP</td>
<td>National Toxicology Program</td>
</tr>
<tr>
<td>NZIoC</td>
<td>New Zealand Inventory of Chemicals</td>
</tr>
<tr>
<td>NOAEL</td>
<td>No Observable Adverse Effect Level</td>
</tr>
<tr>
<td>NOEC</td>
<td>No Observed Effect Concentration</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health Administration</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
</tr>
<tr>
<td>PICCS</td>
<td>Philippines Inventory of Commercial Chemical Substances</td>
</tr>
<tr>
<td>PRNT</td>
<td>Presumed Not Toxic</td>
</tr>
<tr>
<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
</tr>
<tr>
<td>STEL</td>
<td>Short-term Exposure Limit</td>
</tr>
<tr>
<td>SARA</td>
<td>Superfund Amendments and Reauthorization Act.</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>TWA</td>
<td>Time Weighted Average</td>
</tr>
<tr>
<td>TSCA</td>
<td>Toxic Substance Control Act</td>
</tr>
<tr>
<td>UVCB</td>
<td>Unknown or Variable Composition, Complex Reaction Products, and Biological Materials</td>
</tr>
<tr>
<td>WHMIS</td>
<td>Workplace Hazardous Materials Information System</td>
</tr>
</tbody>
</table>

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

- **H315**  Causes skin irritation.
- **H317**  May cause an allergic skin reaction.
- **H319**  Causes serious eye irritation.
- **H413**  May cause long lasting harmful effects to aquatic life.
## Annex

### 1. Short title of Exposure Scenario: Manufacture

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU3: Industrial Manufacturing (all)</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure</td>
</tr>
<tr>
<td></td>
<td>PROC2: Use in closed, continuous process with occasional controlled exposure</td>
</tr>
<tr>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</td>
</tr>
<tr>
<td></td>
<td>PROC15: Use as laboratory reagent</td>
</tr>
</tbody>
</table>

**Environmental release category: ERC1: Manufacture of substances**

### 2.1 Contributing scenario controlling environmental exposure for: ERC1: Manufacture of substances

#### Environment factors not influenced by risk management

<table>
<thead>
<tr>
<th>Flow rate</th>
<th>0 m³/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks</td>
<td>Not relevant since there is no release to waste water (dry process).</td>
</tr>
</tbody>
</table>

#### Other given operational conditions affecting environmental exposure

<table>
<thead>
<tr>
<th>Local release to the environment</th>
<th>Emission or Release Factor: Air</th>
<th>0 %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Emission or Release Factor: Water</td>
<td>0 %</td>
</tr>
<tr>
<td></td>
<td>Emission or Release Factor: Soil</td>
<td>0 %</td>
</tr>
<tr>
<td>Local release rate: Water</td>
<td>0 kg/day</td>
<td></td>
</tr>
<tr>
<td>Remarks</td>
<td>The waste of the substance is collected in a slop tank and treated as a waste by a dedicated contractor.</td>
<td></td>
</tr>
<tr>
<td>Local release rate: Air</td>
<td>0 kg/day</td>
<td></td>
</tr>
<tr>
<td>Remarks</td>
<td>Incineration of gases with efficiency 100%.</td>
<td></td>
</tr>
<tr>
<td>Local release rate: Soil</td>
<td>0 kg/day</td>
<td></td>
</tr>
<tr>
<td>Remarks</td>
<td>There is no direct exposure to soil.</td>
<td></td>
</tr>
</tbody>
</table>

#### Technical conditions and measures / Organizational measures

| Remarks | Not applicable |

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

<table>
<thead>
<tr>
<th>Type of Sewage Treatment Plant</th>
<th>Municipal sewage treatment plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness (of a measure)</td>
<td>0 %</td>
</tr>
<tr>
<td>Remarks</td>
<td>Not relevant since there is no release to waste water (dry process).</td>
</tr>
</tbody>
</table>

### 2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure

#### Product characteristics

<table>
<thead>
<tr>
<th>SDS Number</th>
<th>100000014573</th>
</tr>
</thead>
</table>
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Physical Form (at time of use) : Liquid substance
Process Temperature : <= 40 °C

Frequency and duration of use
Exposure duration : < 4 h

Human factors not influenced by risk management
Exposed skin area : One hand face only (240 cm²)

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor
Remarks : Good general ventilation (3-5 air changes per hour)

Technical conditions and measures
Use product only in closed system.
Local exhaust ventilation - inhalation: No (Effectiveness: 0 %)

Conditions and measures related to personal protection, hygiene and health evaluation
Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, No (Effectiveness: 0 %)

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure

Product characteristics
Physical Form (at time of use) : Liquid substance
Process Temperature : <= 40 °C

Frequency and duration of use
Exposure duration : < 1 h

Human factors not influenced by risk management
Exposed skin area : Palms of both hands (480 cm²)

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor
Remarks : Good general ventilation (3-5 air changes per hour)

Technical conditions and measures
Closed continuous process with occasional controlled exposure
Local exhaust ventilation - inhalation: Yes (Effectiveness: 90 %)
Local exhaust ventilation-dermal: No (Effectiveness: 0 %)

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

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

SDS Number: 100000014573 17/46
### Product characteristics
- **Physical Form (at time of use):** Liquid substance
- **Process Temperature:** \( \leq 40 ^\circ C \)

### Frequency and duration of use
- **Exposure duration:** \(< 1 \text{ h}\)

### Human factors not influenced by risk management
- **Exposed skin area:** Two hands (960 cm²)

### Other operational conditions affecting workers exposure
- **Outdoor / Indoor:** Indoor
- **Remarks:** Good general ventilation (3-5 air changes per hour)

### Technical conditions and measures
- Semi-closed process with occasional controlled exposure
- Local exhaust ventilation - inhalation.: Yes (Effectiveness: 95 %)
- Local exhaust ventilation - dermal.: Yes (Effectiveness: 95 %)

### Conditions and measures related to personal protection, hygiene and health evaluation
- **Eye Protection:** Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- **Respiratory Protection:** No (Effectiveness: 0 %)
- **Dermal Protection:** Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 80 %)

---

### 2.2 Contributing scenario controlling worker exposure for: PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

<table>
<thead>
<tr>
<th>Physical Form (at time of use)</th>
<th>Liquid substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Temperature</td>
<td>( \leq 40 ^\circ C )</td>
</tr>
<tr>
<td>Exposure duration</td>
<td>(&lt; 1 \text{ h})</td>
</tr>
</tbody>
</table>

### Human factors not influenced by risk management
- **Exposed skin area:** Palms of both hands (480 cm²)

### Other operational conditions affecting workers exposure
- **Outdoor / Indoor:** Indoor
- **Remarks:** Enhanced general ventilation (5-10 air changes per hour)

### Technical conditions and measures
- Semi-closed process with occasional controlled exposure
- Local exhaust ventilation - inhalation.: Yes (Effectiveness: 90 %)
- Local exhaust ventilation - dermal.: No (Effectiveness: 0 %)

### Conditions and measures related to personal protection, hygiene and health evaluation
- **Eye Protection:** Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- **Respiratory Protection:** No (Effectiveness: 0 %)
- **Dermal Protection:** Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 95 %)
2.2 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent

Product characteristics
- Physical Form (at time of use): Liquid substance
- Process Temperature: <= 40 °C

Frequency and duration of use
- Exposure duration: < 1 h

Human factors not influenced by risk management
- Exposed skin area: One hand face only (240 cm²)

Other operational conditions affecting workers exposure
- Outdoor / Indoor: Indoor
- Remarks: Good general ventilation (3-5 air changes per hour)

Technical conditions and measures
- Local exhaust ventilation- inhalation,: Yes, Carry out in a vented booth provided with laminar airflow. (Effectiveness: 99 %)
- Local exhaust ventilation- dermal,: No (Effectiveness: 0 %)

Conditions and measures related to personal protection, hygiene and health evaluation
- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection: No (Effectiveness: 0 %)
- Dermal Protection: Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

3. Exposure estimation and reference to its source

<table>
<thead>
<tr>
<th>Environment</th>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC1</td>
<td>EUSES</td>
<td>Marine sediment</td>
<td></td>
<td></td>
<td>0,0004866 mg/kg dry weight (d.w.)</td>
<td>&lt; 0,01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sewage treatment plant</td>
<td></td>
<td></td>
<td>0 mg/L</td>
<td>&lt; 0,01</td>
<td></td>
</tr>
</tbody>
</table>

ERC1: Manufacture of substances

<table>
<thead>
<tr>
<th>Workers/Consumers</th>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC1</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,035 mg/m³</td>
<td>0,071</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,034 mg/kg/d</td>
<td>0,02</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,091</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>PROC2</th>
<th>ECETOC TRA Modified</th>
<th>Worker – inhalation, long-term – systemic</th>
<th>0,118 mg/m³</th>
<th>0,236</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,274 mg/kg/d</td>
<td>0,161</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined</td>
<td></td>
<td>0,397</td>
</tr>
<tr>
<td>PROC8b</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,295 mg/m³</td>
<td>0,59</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,137 mg/kg/d</td>
<td>0,081</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined</td>
<td></td>
<td>0,671</td>
</tr>
<tr>
<td>PROC9</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,253 mg/m³</td>
<td>0,506</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,343 mg/kg/d</td>
<td>0,202</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined</td>
<td></td>
<td>0,708</td>
</tr>
<tr>
<td>PROC15</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,059 mg/m³</td>
<td>0,118</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,068 mg/kg/d</td>
<td>0,04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined</td>
<td></td>
<td>0,158</td>
</tr>
</tbody>
</table>

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC8b: Transfer of substance or preparation (charging/discharing) from/to vessels/large containers at dedicated facilities

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC15: Use as laboratory reagent

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

Not applicable

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

Process category: PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15: Use as laboratory reagent

Environmental release category : ERC2: Formulation of preparations
Further information : Formulation of preparations for Gold Paint for glassware and ceramics.

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

Environment factors not influenced by risk management
Flow rate : 18.000 m³/d

Other given operational conditions affecting environmental exposure
Local release to the environment
Emission or Release Factor: Air : 0,1 %
Emission or Release Factor: Water : 0,3 %
Emission or Release Factor: Soil : 0,01 %
Local release rate: Air : 0,1 kg/day
Local release rate: Water : 0,3 kg/day
Local release rate: Soil : 0,01 kg/day

Technical conditions and measures / Organizational measures
Remarks : Sludge should be incinerated, contained or reclaimed.
Remarks : No application of sewage sludge to soil

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
Effectiveness (of a measure) : 96 %
Sludge Treatment : Not applicable

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure

Product characteristics
Physical Form (at time of use) : Liquid substance
Process Temperature : <= 40 °C

Frequency and duration of use
Exposure duration : < 4 h

Human factors not influenced by risk management
Exposed skin area : One hand face only (240 cm²)

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor
Remarks : Good general ventilation (3-5 air changes per hour)
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### Technical conditions and measures

Use product only in closed system.  
Local exhaust ventilation- inhalation:, No (Effectiveness: 0 %)

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

Respiratory Protection, No (Effectiveness: 0 %)  
Dermal Protection, No (Effectiveness: 0 %)

### 2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure

#### Product characteristics

| Physical Form (at time of use) | Liquid substance |
| Process Temperature | <= 40 °C |

#### Frequency and duration of use

| Exposure duration | < 4 h |

#### Human factors not influenced by risk management

| Exposed skin area | Palms of both hands (480 cm²) |

#### Other operational conditions affecting workers exposure

| Outdoor / Indoor | Indoor |
| Remarks | Good general ventilation (3-5 air changes per hour) |

#### Technical conditions and measures

Closed continuous process with occasional controlled exposure  
Local exhaust ventilation- inhalation:, No (Effectiveness: 0 %)

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

Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact  
Respiratory Protection, No (Effectiveness: 0 %)  
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

### 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 |
| Process Temperature | <= 40 °C |

#### Frequency and duration of use

| Exposure duration | < 1 h |

#### Human factors not influenced by risk management

| Exposed skin area | One hand face only (240 cm²) |

#### Other operational conditions affecting workers exposure

| Outdoor / Indoor | Indoor |
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<table>
<thead>
<tr>
<th>Remarks</th>
<th>Good general ventilation (3-5 air changes per hour)</th>
</tr>
</thead>
</table>

### Technical conditions and measures
- Closed continuous process with occasional controlled exposure
- Local exhaust ventilation - inhalation: No (Effectiveness: 0 %)

### Conditions and measures related to personal protection, hygiene and health evaluation
- Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection, No (Effectiveness: 0 %)
- Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

### 2.2 Contributing scenario controlling worker exposure for: PROC4, PROC9: Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

### Product characteristics
- Physical Form (at time of use): Liquid substance
- Process Temperature: \( \leq 40 ^\circ C \)

### Frequency and duration of use
- Exposure duration: < 1 h

### Human factors not influenced by risk management
- Exposed skin area: Palms of both hands (480 cm²)

### Other operational conditions affecting workers exposure
- Outdoor / Indoor: Indoor
- Remarks: Enhanced general ventilation (5-10 air changes per hour)

### Technical conditions and measures
- Semi-closed process with occasional controlled exposure
- Local exhaust ventilation - inhalation: No (Effectiveness: 0 %)

### Conditions and measures related to personal protection, hygiene and health evaluation
- Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection, No (Effectiveness: 0 %)
- Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

### 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
- Process Temperature: \( \leq 40 ^\circ C \)

### Frequency and duration of use

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<table>
<thead>
<tr>
<th>Exposure duration</th>
<th>&lt; 15 min</th>
</tr>
</thead>
</table>

**Human factors not influenced by risk management**

- Exposed skin area: Two hands (960 cm²)

**Other operational conditions affecting workers exposure**

- Outdoor / Indoor: Indoor
- Remarks: Enhanced general ventilation (5-10 air changes per hour)

**Technical conditions and measures**

- Local exhaust ventilation - inhalation: No (Effectiveness: 0 %)

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

- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection: No (Effectiveness: 0 %)
- Dermal Protection: Yes, Wear chemically resistant gloves (tested to EN374) in combination with basic employee training. (Effectiveness: 80 %)

---

### 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
- Process Temperature: <= 40 °C

**Frequency and duration of use**

- Exposure duration: < 1 h

**Human factors not influenced by risk management**

- Exposed skin area: Two hands (960 cm²)

**Other operational conditions affecting workers exposure**

- Outdoor / Indoor: Indoor
- Remarks: Enhanced general ventilation (5-10 air changes per hour)

**Technical conditions and measures**

- Semi-closed process with occasional controlled exposure
- Local exhaust ventilation - inhalation: No (Effectiveness: 0 %)

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

- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection: No (Effectiveness: 0 %)
- Dermal Protection: Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

---

### 2.2 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent

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Product characteristics

Physical Form (at time of use) : Liquid substance

Process Temperature : <= 40 °C

Frequency and duration of use

Exposure duration : < 1 h

Human factors not influenced by risk management

Exposed skin area : One hand face only (240 cm2)

Other operational conditions affecting workers exposure

Outdoor / Indoor : Indoor

Remarks : Enhanced general ventilation (5-10 air changes per hour)

Technical conditions and measures

Local exhaust ventilation- inhalation:; No (Effectiveness: 0 %)

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

Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)

Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

3. Exposure estimation and reference to its source

Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC2</td>
<td>EUSES</td>
<td>freshwater sediment</td>
<td></td>
<td>0.253 mg/kg dry weight (d.w.)</td>
<td>0.084</td>
<td>&lt; 0,01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>marine sediment</td>
<td></td>
<td>0.025 mg/kg dry weight (d.w.)</td>
<td>0.084</td>
<td>&lt; 0,01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sewage treatment plant</td>
<td></td>
<td>0.006 mg/L</td>
<td>&lt; 0,01</td>
<td></td>
</tr>
</tbody>
</table>

ERC2: Formulation of preparations

Workers/Consumers

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC1</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.004 mg/m³</td>
<td>&lt; 0,01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0.003 mg/kg/d</td>
<td>&lt; 0,01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td></td>
<td>&lt; 0,01</td>
<td></td>
</tr>
<tr>
<td>PROC2</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.354 mg/m³</td>
<td>0.708</td>
<td></td>
</tr>
</tbody>
</table>
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Worker – dermal, long-term – systemic 0,027 mg/kg/d 0,016
Worker – long-term – systemic Combined routes 0,724

PROC3 ECETOC TRA Modified Worker – inhalation, long-term – systemic 0,354 mg/m3 0,708
Worker – dermal, long-term – systemic 0,014 mg/kg/d < 0,01
Worker – long-term – systemic Combined routes 0,716

PROC4, PROC9 ECETOC TRA Modified Worker – inhalation, long-term – systemic 0,253 mg/m3 0,506
Worker – dermal, long-term – systemic 0,137 mg/kg/d 0,081
Worker – long-term – systemic Combined routes 0,587

PROC8a ECETOC TRA Modified Worker – inhalation, long-term – systemic 0,253 mg/m3 0,506
Worker – dermal, long-term – systemic 0,274 mg/kg/d 0,161
Worker – long-term – systemic Combined routes 0,667

PROC8b ECETOC TRA Modified Worker – inhalation, long-term – systemic 0,253 mg/m3 0,506
Worker – dermal, long-term – systemic 0,274 mg/kg/d 0,161
Worker – long-term – systemic Combined routes 0,667

PROC15 ECETOC TRA Modified Worker – inhalation, long-term – systemic 0,253 mg/m3 0,506
Worker – dermal, long-term – systemic 0,007 mg/kg/d < 0,01
Worker – long-term – systemic Combined routes 0,51

PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15: Use as laboratory reagent

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

   Not applicable

1. Short title of Exposure Scenario: Use in polymer processing – industrial

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<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU11: Manufacture of rubber products</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure</td>
</tr>
<tr>
<td></td>
<td>PROC2: Use in closed, continuous process with occasional controlled exposure</td>
</tr>
<tr>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</td>
</tr>
<tr>
<td></td>
<td>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</td>
</tr>
<tr>
<td></td>
<td>PROC15: Use as laboratory reagent</td>
</tr>
</tbody>
</table>

| Environmental release category | ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers |

**Further information**:

Chain Transfer Agent for the production of styrene butadiene latex for rubber and paper coating, nitrile rubber, acrylonitrile butadiene styrene (ABS) and also for the production of expandable polystyrene.

### 2.1 Contributing scenario controlling environmental exposure for: ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

**Environment factors not influenced by risk management**

| Flow rate     | 400,000 m3/d |

**Other given operational conditions affecting environmental exposure**

| Emission or Release Factor: Air | 0 % |
| Emission or Release Factor: Water | 0,1 % |
| Emission or Release Factor: Soil | 0,025 % |
| Local release rate: Water | 2,5 kg/day |
| Local release rate: Air | 0 kg/day |

**Technical conditions and measures / Organizational measures**

| Remarks | Sludge should be incinerated, contained or reclaimed. |
| Remarks | No application of sewage sludge to soil |

**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 | 10,000 m3/d |
| Effectiveness (of a measure) | 96 % |
## 2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure

### Product characteristics
- **Physical Form (at time of use):** Liquid substance
- **Process Temperature:** <= 40 °C

### Frequency and duration of use
- **Exposure duration:** < 4 h

### Human factors not influenced by risk management
- **Exposed skin area:** One hand face only (240 cm²)

### Other operational conditions affecting workers exposure
- **Outdoor / Indoor:** Indoor
- **Remarks:** Good general ventilation (3-5 air changes per hour)

### Technical conditions and measures
- Use product only in closed system.
- Local exhaust ventilation - inhalation; No (Effectiveness: 0 %)

### Conditions and measures related to personal protection, hygiene and health evaluation
- Respiratory Protection, No (Effectiveness: 0 %)
- Dermal Protection, No (Effectiveness: 0 %)

## 2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure

### Product characteristics
- **Physical Form (at time of use):** Liquid substance
- **Process Temperature:** <= 40 °C

### Frequency and duration of use
- **Exposure duration:** < 4 h

### Human factors not influenced by risk management
- **Exposed skin area:** Palms of both hands (480 cm²)

### Other operational conditions affecting workers exposure
- **Outdoor / Indoor:** Indoor
- **Remarks:** Good general ventilation (3-5 air changes per hour)

### Technical conditions and measures
- Closed continuous process with occasional controlled exposure
- Local exhaust ventilation- inhalation; No (Effectiveness: 0 %)

### Conditions and measures related to personal protection, hygiene and health evaluation
- Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection, No (Effectiveness: 0 %)
- Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific
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
- Process Temperature: \( \leq 40 \, ^\circ\text{C} \)

Frequency and duration of use
- Exposure duration: \(< 1 \, \text{h}\)

Human factors not influenced by risk management
- Exposed skin area: One hand face only (240 cm\(^2\))

Other operational conditions affecting workers exposure
- Outdoor / Indoor: Indoor
- Remarks: Good general ventilation (3-5 air changes per hour)

Technical conditions and measures
Closed continuous process with occasional controlled exposure
Local exhaust ventilation - inhalation: No (Effectiveness: 0 %)

Conditions and measures related to personal protection, hygiene and health evaluation
- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection: No (Effectiveness: 0 %)
- Dermal Protection: Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC9: Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product characteristics
- Physical Form (at time of use): Liquid substance
- Process Temperature: \( \leq 40 \, ^\circ\text{C} \)

Frequency and duration of use
- Exposure duration: \(< 1 \, \text{h}\)

Human factors not influenced by risk management
- Exposed skin area: Palms of both hands (480 cm\(^2\))

Other operational conditions affecting workers exposure
- Outdoor / Indoor: Indoor
- Remarks: Enhanced general ventilation (5-10 air changes per hour)

Technical conditions and measures
Semi-closed process with occasional controlled exposure
Local exhaust ventilation - inhalation: No (Effectiveness: 0 %)
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### Conditions and measures related to personal protection, hygiene and health evaluation

Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)

Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

---

#### 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 |
| Process Temperature           | <= 40 °C        |

**Frequency and duration of use**

| Exposure duration | < 15 min |

**Human factors not influenced by risk management**

| Exposed skin area | Two hands (960 cm²) |

**Other operational conditions affecting workers exposure**

| Outdoor / Indoor | Indoor |
| Remarks          | Enhanced general ventilation (5-10 air changes per hour) |

**Technical conditions and measures**

Local exhaust ventilation- inhalation.; No (Effectiveness: 0 %)

---

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

Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)

Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

---

#### 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 |
| Process Temperature           | <= 40 °C        |

**Frequency and duration of use**

| Exposure duration | < 1 h |

**Human factors not influenced by risk management**

| Exposed skin area | Two hands (960 cm²) |
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**Other operational conditions affecting workers exposure**

- Outdoor / Indoor: Indoor
- Remarks: Enhanced general ventilation (5-10 air changes per hour)

**Technical conditions and measures**

- Semi-closed process with occasional controlled exposure
- Local exhaust ventilation- inhalation.: No (Effectiveness: 0 %)

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

- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection: No (Effectiveness: 0 %)
- Dermal Protection: Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

**2.2 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent**

**Product characteristics**

- Physical Form (at time of use): Liquid substance
- Process Temperature: <= 40 °C

**Frequency and duration of use**

- Exposure duration: < 1 h

**Human factors not influenced by risk management**

- Exposed skin area: One hand face only (240 cm²)

**Other operational conditions affecting workers exposure**

- Outdoor / Indoor: Indoor
- Remarks: Enhanced general ventilation (5-10 air changes per hour)

**Technical conditions and measures**

- Local exhaust ventilation- inhalation.: No (Effectiveness: 0 %)

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

- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection: No (Effectiveness: 0 %)
- Dermal Protection: Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

---

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

**Environment**

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC6d</td>
<td>EUSES</td>
<td>Freshwater</td>
<td></td>
<td>0.106 mg/kg</td>
<td>0.035</td>
<td></td>
</tr>
</tbody>
</table>

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### Workers/Consumers

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC1</td>
<td>ECETOC TTRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,004 mg/m³</td>
<td>&lt; 0,01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,003 mg/kg/d</td>
<td>&lt; 0,01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>&lt; 0,01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC2</td>
<td>ECETOC TTRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,354 mg/m³</td>
<td>0,708</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,027 mg/kg/d</td>
<td>0,016</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,724</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC3</td>
<td>ECETOC TTRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,354 mg/m³</td>
<td>0,708</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,014 mg/kg/d</td>
<td>&lt; 0,01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,716</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC4, PROC9</td>
<td>ECETOC TTRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,253 mg/m³</td>
<td>0,506</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,137 mg/kg/d</td>
<td>0,081</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,587</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC8a</td>
<td>ECETOC TTRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,253 mg/m³</td>
<td>0,506</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,274 mg/kg/d</td>
<td>0,161</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,667</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC8b</td>
<td>ECETOC TTRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,253 mg/m³</td>
<td>0,506</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,274 mg/kg/d</td>
<td>0,161</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,667</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC15</td>
<td>ECETOC TTRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,253 mg/m³</td>
<td>0,506</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,007 mg/kg/d</td>
<td>&lt; 0,01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,51</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PROC1**: Use in closed process, no likelihood of exposure

**PROC2**: Use in closed, continuous process with occasional controlled exposure

**PROC3**: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15: Use as laboratory reagent

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

Not applicable

1. Short title of Exposure Scenario: **Lubricants - Industrial**

| Main User Groups | SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Sector of use    | SU0: Other |
| Process category | PROC1: Use in closed process, no likelihood of exposure |
|                  | PROC2: Use in closed, continuous process with occasional controlled exposure |
|                  | PROC3: Use in closed batch process (synthesis or formulation) |
|                  | PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises |
|                  | PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
|                  | PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
|                  | PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
|                  | PROC15: Use as laboratory reagent |

| Environmental release category | ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates) |

2.1 Contributing scenario controlling environmental exposure for: ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

**Environment factors not influenced by risk management**

| Flow rate | 400,000 m3/d |

**Other given operational conditions affecting environmental exposure**

| Local release to the environment |
| Emission or Release Factor: Air | 0,001 % |
| Emission or Release Factor: Water | 0,3 % |
| Emission or Release Factor: Soil  | 0,001 % |
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Local release rate: Air : 0,025 kg/day
Local release rate: Water : 7,5 kg/day

Technical conditions and measures / Organizational measures
Remarks : Sludge should be incinerated, contained or reclaimed.
Remarks : No application of sewage sludge to soil

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 : 10,000 m³/d
Sludge Treatment : Not applicable

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure

Product characteristics
Physical Form (at time of use) : Liquid substance
Process Temperature : <= 40 °C

Frequency and duration of use
Exposure duration : < 15 min

Human factors not influenced by risk management
Exposed skin area : One hand face only (240 cm²)

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor
Remarks : Good general ventilation (3-5 air changes per hour)

Technical conditions and measures
Use product only in closed system.
Local exhaust ventilation- inhalation: No (Effectiveness: 0 %)
Local exhaust ventilation-dermal: No (Effectiveness: 0 %)

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, No (Effectiveness: 0 %)

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure

Product characteristics
Physical Form (at time of use) : Liquid substance
Process Temperature : <= 40 °C

Frequency and duration of use
Exposure duration : < 15 min

Human factors not influenced by risk management
Exposed skin area : Palms of both hands (480 cm²)

Other operational conditions affecting workers exposure
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<table>
<thead>
<tr>
<th>Remarks</th>
<th>Indoor</th>
<th>Good general ventilation (3-5 air changes per hour)</th>
</tr>
</thead>
</table>

**Technical conditions and measures**
- Closed continuous process with occasional controlled exposure
- Local exhaust ventilation- inhalation: Yes (Effectiveness: 90 %)
- Local exhaust ventilation-dermal: No (Effectiveness: 0 %)

**Conditions and measures related to personal protection, hygiene and health evaluation**
- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection: Yes, Respirator with APF of 10 (Effectiveness: 90 %)
- Dermal Protection: Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 80 %)

### 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
- Process Temperature: \(\leq 40 \, ^\circ C\)

**Frequency and duration of use**
- Exposure duration: < 15 min

**Human factors not influenced by risk management**
- Exposed skin area: One hand face only (240 cm²)

**Other operational conditions affecting workers exposure**
- Outdoor / Indoor: Indoor
- Remarks: Good general ventilation (3-5 air changes per hour)

**Technical conditions and measures**
- Closed continuous process with occasional controlled exposure
- Local exhaust ventilation- inhalation: Yes (Effectiveness: 90 %)
- Local exhaust ventilation-dermal: No

**Conditions and measures related to personal protection, hygiene and health evaluation**
- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection: Yes, Respirator with APF of 10 (Effectiveness: 90 %)
- Dermal Protection: Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 80 %)

### 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
- Process Temperature: \(\leq 40 \, ^\circ C\)

**Frequency and duration of use**
- Exposure duration: < 15 min
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Human factors not influenced by risk management
Exposed skin area : Palms of both hands (480 cm2)

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor
Remarks : Good general ventilation (3-5 air changes per hour)

Technical conditions and measures
Semi-closed process with occasional controlled exposure
Local exhaust ventilation - inhalation : Yes (Effectiveness: 90 %)
Local exhaust ventilation - dermal : No (Effectiveness: 0 %)

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection : Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
Respiratory Protection : Yes, Respirator with APF of 10 (Effectiveness: 90 %)
Dermal Protection : Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 90 %)

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
Process Temperature : <= 40 °C

Frequency and duration of use
Exposure duration : < 15 min

Human factors not influenced by risk management
Exposed skin area : Two hands (960 cm2)

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor
Remarks : Good general ventilation (3-5 air changes per hour)

Technical conditions and measures
Local exhaust ventilation - inhalation : Yes (Effectiveness: 90 %)
Local exhaust ventilation - dermal : No (Effectiveness: 0 %)

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection : Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
Respiratory Protection : Yes, Respirator with APF of 10 (Effectiveness: 90 %)
Dermal Protection : Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 95 %)

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
SDS Number: 100000014573
<table>
<thead>
<tr>
<th>SAFETY DATA SHEET</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sulfole® 120B Mercaptan</strong></td>
<td></td>
</tr>
<tr>
<td>Version 5.6</td>
<td>Revision Date 2018-03-21</td>
</tr>
</tbody>
</table>

**Physical Form (at time of use)**: Liquid substance

**Process Temperature**: <= 40 °C

**Frequency and duration of use**

| Exposure duration | < 15 min |

**Human factors not influenced by risk management**

| Exposed skin area | Two hands (960 cm²) |

**Other operational conditions affecting workers exposure**

| Outdoor / Indoor | Indoor |
| Remarks | Good general ventilation (3-5 air changes per hour) |

**Technical conditions and measures**

- Semi-closed process with occasional controlled exposure
- Local exhaust ventilation- inhalation: Yes (Effectiveness: 95 %)
- Local exhaust ventilation-dermal: No (Effectiveness: 0 %)

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

- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection: Yes, Respirator with APF of 10 (Effectiveness: 90 %)
- Dermal Protection: Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 95 %)

2.2 Contributing scenario controlling worker exposure for: PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

**Product characteristics**

| Physical Form (at time of use) | Liquid substance |
| Process Temperature | <= 40 °C |

**Frequency and duration of use**

| Exposure duration | < 15 min |

**Human factors not influenced by risk management**

| Exposed skin area | Palms of both hands (480 cm²) |

**Other operational conditions affecting workers exposure**

| Outdoor / Indoor | Indoor |
| Remarks | Good general ventilation (3-5 air changes per hour) |

**Technical conditions and measures**

- Semi-closed process with occasional controlled exposure
- Local exhaust ventilation- inhalation: Yes (Effectiveness: 90 %)
- Local exhaust ventilation-dermal: No (Effectiveness: 0 %)

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

- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection: Yes, Respirator with APF of 10 (Effectiveness: 90 %)
- Dermal Protection: Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 90 %)
## 2.2 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent

### Product characteristics
- **Physical Form (at time of use):** Liquid substance
- **Process Temperature:** <= 40 °C

### Frequency and duration of use
- **Exposure duration:** < 15 min

### Human factors not influenced by risk management
- **Exposed skin area:** One hand face only (240 cm²)

### Other operational conditions affecting workers exposure
- **Outdoor / Indoor:** Indoor
- **Remarks:** Good general ventilation (3-5 air changes per hour)

### Technical conditions and measures
- Local exhaust ventilation- inhalation:, Yes (Effectiveness: 90 %)
- Local exhaust ventilation-dermal:, No (Effectiveness: 0 %)

### Conditions and measures related to personal protection, hygiene and health evaluation
- **Eye Protection:** Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- **Respiratory Protection:** Yes, Respirator with APF of 10 (Effectiveness: 90 %)
- **Dermal Protection:** Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

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

#### Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC6a</td>
<td>EUSES</td>
<td>Freshwater sediment</td>
<td></td>
<td>0,307 mg/kg dry weight (d.w.)</td>
<td>0,102</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td></td>
<td>0,124 mg/kg dry weight (d.w.)</td>
<td>0,414</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sewage treatment plant</td>
<td></td>
<td>0,031 mg/L</td>
<td>&lt; 0,01</td>
<td></td>
</tr>
</tbody>
</table>

**ERC6a:** Industrial use resulting in manufacture of another substance (use of intermediates)

#### Workers/Consumers

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC1</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,006 mg/m³</td>
<td>0,012</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,034 mg/kg/d</td>
<td>0,02</td>
<td></td>
</tr>
<tr>
<td>PROC2</td>
<td>ECETOC TRA</td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,006 mg/m³</td>
<td>0,012</td>
<td></td>
</tr>
</tbody>
</table>

SDS Number: 100000014573 38/46
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Usage Details</th>
<th>Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC3</td>
<td>ECETOC TRA</td>
<td>Worker – inhalation, long-term – systemic</td>
</tr>
<tr>
<td></td>
<td>Modified</td>
<td>Worker – dermal, long-term – systemic</td>
</tr>
<tr>
<td>PROC4</td>
<td>ECETOC TRA</td>
<td>Worker – inhalation, long-term – systemic</td>
</tr>
<tr>
<td></td>
<td>Modified</td>
<td>Worker – dermal, long-term – systemic</td>
</tr>
<tr>
<td>PROC8a</td>
<td>ECETOC TRA</td>
<td>Worker – inhalation, long-term – systemic</td>
</tr>
<tr>
<td></td>
<td>Modified</td>
<td>Worker – dermal, long-term – systemic</td>
</tr>
<tr>
<td>PROC8b</td>
<td>ECETOC TRA</td>
<td>Worker – inhalation, long-term – systemic</td>
</tr>
<tr>
<td></td>
<td>Modified</td>
<td>Worker – dermal, long-term – systemic</td>
</tr>
<tr>
<td>PROC9</td>
<td>ECETOC TRA</td>
<td>Worker – inhalation, long-term – systemic</td>
</tr>
<tr>
<td></td>
<td>Modified</td>
<td>Worker – dermal, long-term – systemic</td>
</tr>
<tr>
<td>PROC15</td>
<td>ECETOC TRA</td>
<td>Worker – inhalation, long-term – systemic</td>
</tr>
<tr>
<td></td>
<td>Modified</td>
<td>Worker – dermal, long-term – systemic</td>
</tr>
</tbody>
</table>

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

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

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

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

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

PROC15: Use as laboratory reagent
4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Not applicable
1. Short title of Exposure Scenario: Use in mining – industrial

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU2a: Mining, (without offshore industries)</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure PROC2: Use in closed, continuous process with occasional controlled exposure PROC3: Use in closed batch process (synthesis or formulation) PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</td>
</tr>
<tr>
<td>Environmental release category</td>
<td>ERC4: Industrial use of processing aids in processes and products, not becoming part of articles</td>
</tr>
<tr>
<td>Further information</td>
<td>Used effectively as a secondary/scavenger collector for base metal sulfides.</td>
</tr>
</tbody>
</table>

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

Environment factors not influenced by risk management

- Flow rate: 18.000 m³/d

Other given operational conditions affecting environmental exposure

- Local release to the environment
  - Emission or Release Factor: Air: 0 %
  - Emission or Release Factor: Water: 0,1 %
  - Emission or Release Factor: Soil: 0,025 %
- Local release rate: Air: 0 kg/day
- Local release rate: Water: 1 kg/day

Technical conditions and measures / Organizational measures

- Remarks: Not applicable

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
### 2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure

**Product characteristics**
- **Physical Form (at time of use):** Liquid substance
- **Process Temperature:** <= 40 °C

**Frequency and duration of use**
- **Exposure duration:** < 4 h

**Human factors not influenced by risk management**
- **Exposed skin area:** One hand face only (240 cm²)

**Other operational conditions affecting workers exposure**
- **Outdoor / Indoor:** Indoor
- **Remarks:** Good general ventilation (3-5 air changes per hour)

**Technical conditions and measures**
- Use product only in closed system.
- Local exhaust ventilation- inhalation; No (Effectiveness: 0 %)

**Conditions and measures related to personal protection, hygiene and health evaluation**
- Respiratory Protection, No (Effectiveness: 0 %)
- Dermal Protection, No (Effectiveness: 0 %)

### 2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure

**Product characteristics**
- **Physical Form (at time of use):** Liquid substance
- **Process Temperature:** <= 40 °C

**Frequency and duration of use**
- **Exposure duration:** < 4 h

**Human factors not influenced by risk management**
- **Exposed skin area:** Palms of both hands (480 cm²)

**Other operational conditions affecting workers exposure**
- **Outdoor / Indoor:** Indoor
- **Remarks:** Good general ventilation (3-5 air changes per hour)

**Technical conditions and measures**
- Closed continuous process with occasional controlled exposure
- Local exhaust ventilation- inhalation; No (Effectiveness: 0 %)

**Conditions and measures related to personal protection, hygiene and health evaluation**
- Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection, No (Effectiveness: 0 %)
**Sulfole® 120B Mercaptan**

**Version 5.6**

Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

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

<table>
<thead>
<tr>
<th><strong>Product characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Form (at time of use)</td>
<td>Liquid substance</td>
</tr>
<tr>
<td>Process Temperature</td>
<td>&lt;= 40 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Frequency and duration of use</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure duration</td>
<td>&lt; 1 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Human factors not influenced by risk management</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposed skin area</td>
<td>One hand face only (240 cm²)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Other operational conditions affecting workers exposure</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor / Indoor</td>
<td>Indoor</td>
</tr>
<tr>
<td>Remarks</td>
<td>Good general ventilation (3-5 air changes per hour)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Technical conditions and measures</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed batch process with occasional controlled exposure. Local exhaust ventilation- inhalation:</td>
<td>No (Effectiveness: 0 %)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Conditions and measures related to personal protection, hygiene and health evaluation</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact</td>
<td></td>
</tr>
<tr>
<td>Respiratory Protection, No (Effectiveness: 0 %)</td>
<td></td>
</tr>
<tr>
<td>Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th><strong>Product characteristics</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Form (at time of use)</td>
<td>Liquid substance</td>
</tr>
<tr>
<td>Process Temperature</td>
<td>&lt;= 40 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Frequency and duration of use</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure duration</td>
<td>&lt; 1 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Human factors not influenced by risk management</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposed skin area</td>
<td>Palms of both hands (480 cm²)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Other operational conditions affecting workers exposure</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor / Indoor</td>
<td>Indoor</td>
</tr>
<tr>
<td>Remarks</td>
<td>Enhanced general ventilation (5-10 air changes per hour)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Technical conditions and measures</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-closed process with occasional controlled exposure Local exhaust ventilation- inhalation:</td>
<td>No (Effectiveness: 0 %)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Conditions and measures related to personal protection, hygiene and health evaluation</strong></th>
<th></th>
</tr>
</thead>
</table>
## Eye Protection
Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

## Respiratory Protection
No (Effectiveness: 0 %)

## Dermal Protection
Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 80 %)

### 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
- Process Temperature: <= 40 °C

#### Frequency and duration of use
- Exposure duration: < 15 min

#### Human factors not influenced by risk management
- Exposed skin area: Two hands (960 cm²)

#### Other operational conditions affecting workers exposure
- Outdoor / Indoor: Indoor
- Remarks: Enhanced general ventilation (5-10 air changes per hour)

#### Technical conditions and measures
- Local exhaust ventilation- inhalation.: No (Effectiveness: 0 %)

#### Conditions and measures related to personal protection, hygiene and health evaluation
- Eye Protection, Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection, No (Effectiveness: 0 %)
- Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 80 %)

### 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
- Process Temperature: <= 40 °C

#### Frequency and duration of use
- Exposure duration: < 1 h

#### Human factors not influenced by risk management
- Exposed skin area: Two hands (960 cm²)

#### Other operational conditions affecting workers exposure
- Outdoor / Indoor: Indoor
- Remarks: Enhanced general ventilation (5-10 air changes per hour)
**Technical conditions and measures**
- Semi-closed process with occasional controlled exposure
- Local exhaust ventilation- inhalation; No (Effectiveness: 0 %)

**Conditions and measures related to personal protection, hygiene and health evaluation**
- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection, No (Effectiveness: 0 %)
- Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 80 %)

**2.2 Contributing scenario controlling worker exposure for: PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)**

**Product characteristics**
- Physical Form (at time of use): Liquid substance
- Process Temperature: \( \leq 40 \, ^\circ\text{C} \)

**Frequency and duration of use**
- Exposure duration: \(< 1\, \text{h}\)

**Human factors not influenced by risk management**
- Exposed skin area: Palms of both hands (480 cm²)

**Other operational conditions affecting workers exposure**
- Outdoor / Indoor: Indoor
- Remarks: Enhanced general ventilation (5-10 air changes per hour)

**Technical conditions and measures**
- Semi-closed process with occasional controlled exposure
- Local exhaust ventilation- inhalation; No (Effectiveness: 0 %)

**Conditions and measures related to personal protection, hygiene and health evaluation**
- Eye Protection: Yes, chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact
- Respiratory Protection, No (Effectiveness: 0 %)
- Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 80 %)

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

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC6a</td>
<td>EUSES</td>
<td></td>
<td>Freshwater sediment</td>
<td>0.83 mg/kg dry weight (d.w.)</td>
<td>0.277</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.083 mg/kg dry weight (d.w.)</td>
<td>0.277</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sewage</td>
<td>0.021 mg/L</td>
<td></td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

SDS Number: 100000014573  44/46
**Workers/Consumers**

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC1</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.004 mg/m³</td>
<td>&lt; 0.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0.003 mg/kg/d</td>
<td>&lt; 0.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td></td>
<td>&lt; 0.01</td>
<td></td>
</tr>
<tr>
<td>PROC2</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.354 mg/m³</td>
<td>0.708</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0.027 mg/kg/d</td>
<td>0.016</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td></td>
<td>0.724</td>
<td></td>
</tr>
<tr>
<td>PROC3</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.354 mg/m³</td>
<td>0.708</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0.014 mg/kg/d</td>
<td>&lt; 0.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td></td>
<td>0.716</td>
<td></td>
</tr>
<tr>
<td>PROC4</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.253 mg/m³</td>
<td>0.506</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0.137 mg/kg/d</td>
<td>0.081</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td></td>
<td>0.587</td>
<td></td>
</tr>
<tr>
<td>PROC8a</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.235 mg/m³</td>
<td>0.506</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0.274 mg/kg/d</td>
<td>0.161</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td></td>
<td>0.667</td>
<td></td>
</tr>
<tr>
<td>PROC8b</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.253 mg/m³</td>
<td>0.506</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0.274 mg/kg/d</td>
<td>0.161</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td></td>
<td>0.667</td>
<td></td>
</tr>
<tr>
<td>PROC9</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.253 mg/m³</td>
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<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0.137 mg/kg/d</td>
<td>0.081</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td></td>
<td>0.587</td>
<td></td>
</tr>
</tbody>
</table>

PROC1: Use in closed process, no likelihood of exposure

PROC2: Use in closed, continuous process with occasional controlled exposure

PROC3: Use in closed batch process (synthesis or formulation)

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

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
**PROC8b**: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

**PROC9**: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

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

Not applicable