

**Sulfole® 120 Mercaptan (tert-Dodecyl Mercaptan)**

Version 3.11

Revision Date 2017-05-31

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

Product Name : Sulfole® 120 Mercaptan (tert-Dodecyl Mercaptan)  
Material : 1121184, 1113774, 1017942, 1111452, 1024818, 1024817,  
1103990, 1084934, 1101771, 1086417, 1086418, 1021548,  
1036536, 1035962, 1021538, 1021539, 1021542, 1021543,  
1021544, 1021546, 1021547, 1021550, 1021551, 1021552,  
1021553, 1021719, 1032613, 1021545, 1021549, 10462848

**EC-No.Registration number**

Chemical name	CAS-No. EC-No. Index No.	Legal Entity Registration number
tert-Dodecanethiol	25103-58-6 246-619-1	Chevron Phillips Chemicals International NV 01-2119486132-42-0002

Relevant Identified Uses : Manufacture  
Supported 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 Vincilaan 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:**

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**Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

**Transport:**

CHEMTREC 800.424.9300 or 703.527.3887(int'l)

Asia: CHEMWATCH (+612 9186 1132)

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

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.
Skin sensitization, Sub-category 1B	H317: May cause an allergic skin reaction.
Eye irritation, Category 2	H319: Causes serious eye irritation.
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	<b>Prevention:</b>	
	P264	Wash skin thoroughly after handling.
	P273	Avoid release to the environment.
	P280	Wear protective gloves/ eye protection/ face protection.
	<b>Response:</b>	
	P332 + P313	If skin irritation occurs: Get medical advice/ attention.
	P337 + P313	If eye irritation persists: Get medical advice/ attention.
<b>Disposal:</b>		
P501	Dispose of contents/ container to an	

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approved waste disposal plant.

Hazardous ingredients which must be listed on the label:

- 25103-58-6 tert-Dodecanethiol

**SECTION 3: Composition/information on ingredients**

Synonyms : TDM

Molecular formula : C<sub>12</sub>H<sub>26</sub>S**Mixtures****Hazardous ingredients**

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
tert-Dodecanethiol	25103-58-6 246-619-1	Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1B; H317 Aquatic Chronic 4; H413	90 - 100

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. If symptoms persist, call a physician. Take victim immediately to hospital.

**SECTION 5: Firefighting measures**

Flash point : 98 - 110 °C (208 - 230 °F)

Autoignition temperature : 198 - 230 °C (388 - 446 °F)

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- |  |   |  |
|--|---|--|
| 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. |
| Fire and explosion protection                  | : | Normal measures for preventive fire protection.  |
| 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   | : | Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.                          |

**SECTION 7: Handling and storage****Handling**

- |                         |   |   |
|-------------------------|---|---|
| Advice on safe handling | : | Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. |
|-------------------------|---|---|

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

**Storage**

- |   |   |  |
|---|---|--|
| Requirements for storage areas and containers | : | 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 |
|---|---|--|

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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,	

**DNEL** : End Use: Workers  
Routes of exposure: Inhalation  
Potential health effects: Long-term systemic effects  
Value: 0,5 mg/m3

**DNEL** : End Use: Workers  
Routes of exposure: Skin contact  
Potential health effects: Long-term systemic effects  
Value: 1,7 mg/kg

**DNEL** : End Use: Workers  
Routes of exposure: Skin contact  
Potential health effects: Acute effects  
Value: 0,665 mg/cm2

**DNEL** : End Use: Consumers  
Routes of exposure: Inhalation  
Potential health effects: Long-term systemic effects  
Value: 0,09 mg/m3

**DNEL** : End Use: Consumers  
Routes of exposure: Ingestion  
Potential health effects: Long-term systemic effects  
Value: 0,08 mg/kg

**PNEC** : Fresh water sediment  
Value: 3 mg/kg

**PNEC** : Marine sediment  
Value: 0,3 mg/kg

**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 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. Wear a NIOSH approved respirator that provides protection when working with this

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material if exposure to harmful levels of airborne material may occur, such as:. Air-Purifying Respirator for Dusts and Mists / P100. 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.
- Protective measures : Wear suitable protective equipment. When using do not eat, drink or smoke. Avoid contact with skin.

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**

- Physical state : Liquid
- Color : Colorless
- Odor : Repulsive

**Safety data**

- Flash point : 98 - 110 °C (208 - 230 °F)
- Lower explosion limit : No data available
- Upper explosion limit : No data available
- Oxidizing properties : no
- Autoignition temperature : 198 - 230 °C (388 - 446 °F)
- Thermal decomposition : 300 °F
- Molecular formula : C<sub>12</sub>H<sub>26</sub>S

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Molecular weight	: 202,44 g/mol
pH	: Not applicable
Pour point	: No data available
Melting point/range	-16 °C (3 °F)
Boiling point/boiling range	: 233 °C (451 °F)
Vapor pressure	: 4,00 Pa at 24 °C (75 °F)
Relative density	: 0,86 at 16 °C (61 °F)
Water solubility	: 0,00393 mg/l Method: OECD Test Guideline 105
Partition coefficient: n-octanol/water	: Pow: 7,43 at 20 °C (68 °F)
Viscosity, dynamic	: 2,6 cP at 20 °C (68 °F)
Viscosity, kinematic	: No data available
Relative vapor density	: 3 (Air = 1.0)
Evaporation rate	: < 1

**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.
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**Possibility of hazardous reactions**

Conditions to avoid	: Heat, sparks, fire, and oxidizing agents.
Thermal decomposition	: 300 °F
Hazardous decomposition products	: Carbon oxides Sulfur oxides
Other data	: No decomposition if stored and applied as directed.

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**SECTION 11: Toxicological information****Acute oral toxicity**

tert-Dodecanethiol : LD50: > 5.000 mg/kg  
Species: Rat  
Sex: male and female  
Method: OECD Test Guideline 401  
Information given is based on data obtained from similar substances.

**Acute inhalation toxicity**

tert-Dodecanethiol : LC50: > 1.97milligram per literExposure 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



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Species: Rat, female  
Sex: female  
Application Route: Inhalation  
Dose: 0, 26, 98 ppm  
Exposure time: 4 wk  
Number of exposures: 6 h/d, 5 d/wk  
NOEL: 26 ppm  
Method: OECD Guideline 412  
Target Organs: Liver, Kidney

Species: Dog, male and female  
Sex: male and female  
Application Route: Inhalation  
Dose: 0, 25, 106 ppm  
Exposure time: 4 wk  
Number of exposures: 6 h/d, 5 d/wk  
NOEL: 25 ppm  
Lowest observable effect level: 109 ppm  
Method: OECD Test Guideline 412  
Target Organs: Liver

Species: Mouse, male and female  
Sex: male and female  
Application Route: Inhalation  
Dose: 0, 25, 109 ppm  
Exposure time: 4 wk  
Number of exposures: 6 h/d, 5 d/wk  
Lowest observable effect level: 25 ppm  
Method: OECD Test Guideline 412  
Target Organs: Liver

Species: Rat, male  
Sex: male  
Application Route: oral gavage  
Dose: 10, 50, 250 mg/kg  
Exposure time: 35 d  
Number of exposures: once daily  
NOEL: 50 mg/kg  
Method: OECD Guideline 422  
Target Organs: Liver, spleen  
Information given is based on data obtained from similar substances.

Species: Rat, female  
Sex: female  
Application Route: oral gavage  
Dose: 10, 50, 250 mg/kg  
Exposure time: 53 d  
Number of exposures: once daily  
NOEL: 50 mg/kg  
Method: OECD Guideline 422  
Target Organs: Liver, spleen  
Information given is based on data obtained from similar substances.

Species: Rat, male  
Sex: male  
Application Route: Inhalation  
Dose: 5, 25, 100 ppm  
Exposure time: 90 d

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Number of exposures: 6h/d, 5d/wk  
NOEL: 25 ppm  
Method: OECD Test Guideline 413

Species: Rat, female  
Sex: female  
Application Route: Inhalation  
Dose: 5, 25, 100 ppm  
Exposure time: 90 d  
Number of exposures: 6h/d, 5d/wk  
NOEL: 25 ppm  
Method: OECD Test Guideline 413

**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:  $\geq 250$  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:  $\geq 88.6$  ppm  
No adverse effects expected

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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:  $\geq$  88.6 ppm  
No adverse effects expected

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

**CMR effects**

tert-Dodecanethiol : 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

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

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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.

**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**

tert-Dodecanethiol : Result: Not readily biodegradable.  
 0 %  
 Testing period: 28 d  
 Method: OECD Test Guideline 301D

**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 lasting harmful effects to aquatic life.

**SECTION 13: Disposal considerations**

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

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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.

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)**

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

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

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

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**

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.

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

**Other information** : tert- Dodecanethiol, S.T. 3, Cat.Y

**SECTION 15: Regulatory information****National legislation**

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

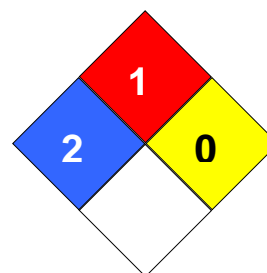
**Water contaminating class (Germany)** : WGK 2 water endangering  
VwVwS

**Notification status**

Europe REACH	:	On the inventory, or in compliance with the inventory
United States of America (USA) 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: 1  
Reactivity Hazard: 0

**Further information**

Legacy SDS Number : 34650

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

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guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**Key or legend to abbreviations and acronyms used in the safety data sheet**

ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		

**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.

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**Annex****1. Short title of Exposure Scenario: Manufacture**

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: <b>SU3:</b> Industrial Manufacturing (all)
Process category	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC15:</b> Use as laboratory reagent
Environmental release category	: <b>ERC1:</b> Manufacture of substances

**2.1 Contributing scenario controlling environmental exposure for: ERC1: Manufacture of substances****Environment factors not influenced by risk management**

Flow rate	: 0 m3/d
Remarks	: Not relevant since there is no release to waste water (dry process).

**Other given operational conditions affecting environmental exposure**

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

**Technical conditions and measures / Organizational measures**

Remarks	: Not applicable
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**Conditions and measures related to municipal sewage treatment plant**

Type of Sewage Treatment Plant	: Municipal sewage treatment plant
Effectiveness (of a measure)	: 0 %
Remarks	: Not relevant since there is no release to waste water (dry process).

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

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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 cm<sup>2</sup>)

**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 cm<sup>2</sup>)

**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**

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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 : Two hands (960 cm<sup>2</sup>)

**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)****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 cm<sup>2</sup>)

**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 %)

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**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 cm<sup>2</sup>)

**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****Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC1	EUSES		Marine sediment		0,0004866 mg/kg dry weight (d.w.)	< 0,01
			Sewage treatment plant		0 mg/L	< 0,01

ERC1: Manufacture of substances

**Workers/Consumers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,035 mg/m <sup>3</sup>	0,071
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,02
			Worker – long-term – systemic Combined routes		0,091

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

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/ 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: **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

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**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 : &lt;= 40 °C

**Frequency and duration of use**

Exposure duration : &lt; 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 : &lt;= 40 °C

**Frequency and duration of use**

Exposure duration : &lt; 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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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. (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 : ≤ 40 °C

**Frequency and duration of use**

Exposure duration : &lt; 1 h

**Human factors not influenced by risk management**Exposed skin area : Palms of both hands (480 cm<sup>2</sup>)**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 : ≤ 40 °C

**Frequency and duration of use**

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Exposure duration : &lt; 15 min

**Human factors not influenced by risk management**Exposed skin area : Two hands (960 cm<sup>2</sup>)**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 : &lt; 1 h

**Human factors not influenced by risk management**Exposed skin area : Two hands (960 cm<sup>2</sup>)**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**



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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 cm<sup>2</sup>)

**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**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC2	EUSES		Freshwater sediment		0,253 mg/kg dry weight (d.w.)	0,084
			Marine sediment		0,025 mg/kg dry weight (d.w.)	0,084
			Sewage treatment plant		0,006 mg/L	< 0,01

ERC2: Formulation of preparations

**Workers/Consumers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,004 mg/m <sup>3</sup>	< 0,01
			Worker – dermal, long-term – systemic	0,003 mg/kg/d	< 0,01
			Worker – long-term – systemic Combined routes		< 0,01
PROC2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,354 mg/m <sup>3</sup>	0,708

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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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Main User Groups	:	<b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	<b>SU11:</b> Manufacture of rubber products
Process category	:	<b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC15:</b> Use as laboratory reagent
Environmental release category	:	<b>ERC6d:</b> 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**

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: 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 %

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**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 cm<sup>2</sup>)

**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 cm<sup>2</sup>)

**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

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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  
 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 : <= 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 : 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 cm<sup>2</sup>)

**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 cm<sup>2</sup>)

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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 cm<sup>2</sup>)

**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**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC6d	EUSES		Freshwater		0,106 mg/kg	0,035

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			sediment		dry weight (d.w.)	
			Marine sediment		0,042 mg/kg dry weight (d.w.)	0,139
			Sewage treatment plant		0,01 mg/L	< 0,01

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

**Workers/Consumers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,004 mg/m3	< 0,01
			Worker – dermal, long-term – systemic	0,003 mg/kg/d	< 0,01
			Worker – long-term – systemic Combined routes		< 0,01
PROC2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,354 mg/m3	0,708
			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 – inhalation, 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)



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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	:	<b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	<b>SU0:</b> Other
Process category	:	<b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC15:</b> Use as laboratory reagent
Environmental release category	:	<b>ERC6a:</b> 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 : &lt;= 40 °C

**Frequency and duration of use**

Exposure duration : &lt; 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 : &lt;= 40 °C

**Frequency and duration of use**

Exposure duration : &lt; 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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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, 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 : <= 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 cm<sup>2</sup>)

**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 : <= 40 °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 cm<sup>2</sup>)**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 : &lt; 15 min

**Human factors not influenced by risk management**Exposed skin area : Two hands (960 cm<sup>2</sup>)**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**

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Physical Form (at time of use) : Liquid substance

Process Temperature : ≤ 40 °C

**Frequency and duration of use**

Exposure duration : &lt; 15 min

**Human factors not influenced by risk management**Exposed skin area : Two hands (960 cm<sup>2</sup>)**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 : &lt; 15 min

**Human factors not influenced by risk management**Exposed skin area : Palms of both hands (480 cm<sup>2</sup>)**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 %)

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**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 cm<sup>2</sup>)

**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**

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

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

**Workers/Consumers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,006 mg/m <sup>3</sup>	0,012
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,02
			Worker – long-term – systemic Combined routes		0,032
PROC2	ECETOC TRA		Worker – inhalation,	0,006 mg/m <sup>3</sup>	0,012

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	Modified		long-term – systemic		
			Worker – dermal, long-term – systemic	0,274 mg/kg	0,161
			Worker – long-term – systemic Combined routes		0,173
PROC3	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,018 mg/m3	0,035
			Worker – dermal, long-term – systemic	0,138 mg/kg/d	0,081
			Worker – long-term – systemic Combined routes		0,117
PROC4	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,03 mg/m3	0,059
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,404
			Worker – long-term – systemic Combined routes		0,463
PROC8a	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,059 mg/m3	0,118
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,403
			Worker – long-term – systemic Combined routes		0,521
PROC8b	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,015 mg/m3	0,03
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,403
			Worker – long-term – systemic Combined routes		0,433
PROC9	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,03 mg/m3	0,059
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,404
			Worker – long-term – systemic Combined routes		0,463
PROC15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,03 mg/m3	0,059
			Worker – dermal, long-term – systemic	0,068 mg/kg/d	0,04
			Worker – long-term – systemic Combined routes		0,099

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

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**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**

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

**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



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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 : &lt; 4 h

**Human factors not influenced by risk management**Exposed skin area : One hand face only (240 cm<sup>2</sup>)**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 : &lt; 4 h

**Human factors not influenced by risk management**Exposed skin area : Palms of both hands (480 cm<sup>2</sup>)**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 %)

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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 : <= 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 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Closed batch 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: Use in batch and other process (synthesis) where opportunity for exposure arises****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 cm<sup>2</sup>)

**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**

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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 cm<sup>2</sup>)

**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 cm<sup>2</sup>)

**Other operational conditions affecting workers exposure**

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

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**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 : <= 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 cm<sup>2</sup>)

**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****Environment**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC6a	EUSES		Freshwater sediment		0,83 mg/kg dry weight (d.w.)	0,277
			Marine sediment		0,083 mg/kg dry weight (d.w.)	0,277
			Sewage		0,021 mg/L	< 0,01

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

**Workers/Consumers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,004 mg/m3	< 0,01
			Worker – dermal, long-term – systemic	0,003 mg/kg/d	< 0,01
			Worker – long-term – systemic Combined routes		< 0,01
PROC2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,354 mg/m3	0,708
			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	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	0,235 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
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

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

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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