Sulfole® 100 Mercaptan

Version 1.4 Revision Date 2016-06-21

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

Product information

Product Name : Sulfole® 100 Mercaptan
Material : 1098106, 1024816, 1021527, 1035961, 1021528, 1021529, 1021526, 1027474, 1105025

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

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

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

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

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: +800 CHEMCALL (+800 2436 2255) China:+86-21-22157316
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
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.
Eye irritation, Category 2	H319: Causes serious eye irritation.
Skin sensitization, Category 1	H317: May cause an allergic skin reaction.
Acute aquatic toxicity, Category 1	H400: Very toxic to aquatic life.
Chronic aquatic toxicity, Category 1	H410: Very toxic to aquatic life with long lasting effects.

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.
	H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements :		
	Prevention:	
	P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
	P273	Avoid release to the environment.
	P280	Wear eye protection/ face protection.
	P280	Wear protective gloves.
	Response:	
	P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
	P362 + P364	Take off contaminated clothing and wash it before reuse.

Hazardous ingredients which must be listed on the label:
- 25103-58-6 tert-Dodecanethiol

SECTION 3: Composition/information on ingredients

Synonyms : 100 Mercaptan
TNM and TDM Mixture

Molecular formula : Mixture

Mixtures

Hazardous ingredients

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
tert-Nonanethiol	**25360-10-5** **246-896-9**	Aquatic Acute 1; H400 Aquatic Chronic 1; H410	60 - 75
tert-Dodecanethiol	25103-58-6 246-619-1	Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1B; H317 Aquatic Chronic 4; H413	15 - 40

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. Symptoms of poisoning may appear several hours later. Do not leave the victim unattended.

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. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : 67 °C (153 °F)

Autoignition temperature : No data available

Suitable extinguishing media : Carbon dioxide (CO_2).

Unsuitable extinguishing media : High volume water jet.

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

Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
Fire and explosion protection	:	Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products	:	Carbon oxides. Sulfur oxides.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up	:	Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

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

SECTION 7: Handling and storage

Handling

Advice on safe handling	:	Avoid formation of aerosol. Do not breathe vapors/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Dispose of rinse water in accordance with local and national regulations.
Advice on protection against fire and explosion	:	Do not spray on an open flame or any other incandescent material. Keep away from open flames, hot surfaces and sources of ignition.

Storage

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

SECTION 8: Exposure controls/personal protection

Chevron Phillips Chemical Company LP

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

Engineering measures

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

Personal protective equipment

Respiratory protection : 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 material if exposure to harmful levels of airborne material may occur, such as:. Air-Purifying Respirator for Organic Vapors. 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 in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate:. Flame retardant antistatic protective clothing. Footwear protecting against chemicals.

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

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

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance

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

Safety data

Flash point	:	67 °C (153 °F)
Lower explosion limit	:	No data available
Upper explosion limit	:	No data available
Autoignition temperature	:	No data available
Thermal decomposition	:	No data available
Molecular formula	:	Mixture
Molecular weight	:	Not applicable
pH	:	Not applicable
Freezing point	:	No data available
Pour point		No data available
Boiling point/boiling range	:	188 - 233 °C (370 - 451 °F) estimated
Vapor pressure	:	0,02 PSI at 25,5 °C (77,9 °F)
Relative density	:	0,855 at 15,6 °C (60,1 °F)
Density	:	853,2 g/l
Water solubility	:	Negligible
Partition coefficient: n-octanol/water	:	No data available
Viscosity, dynamic	:	1,77 cP
Relative vapor density	:	3 (Air = 1.0)
Evaporation rate	:	1
Percent volatile	:	> 99 %

SECTION 10: Stability and reactivity

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

Possibility of hazardous reactions

Conditions to avoid : Avoid moisture.
Heat, flames and sparks.

Materials to avoid : Avoid oxidizing agents.

Thermal decomposition : No data available

Hazardous decomposition products : Carbon oxides
Sulfur oxides

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

SECTION 11: Toxicological information

Acute oral toxicity

tert-Nonanethiol : LD50: 5.550 mg/kg
Species: Rat
Method: OECD Test Guideline 401
Symptoms: Disorientation, Loss of balance

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-Nonanethiol : LC50: >7,04milligram per literExposure time: 4 h
Species: Rat
Sex: male and female
Test atmosphere: vapor
Method: OECD Test Guideline 403

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-Nonanethiol	:	LD50: >2000 milligram per kilogram Species: Rat Sex: male Method: OECD Test Guideline 402
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.

Sulfole® 100 Mercaptan
Skin irritation : Causes skin irritation.

Sulfole® 100 Mercaptan
Eye irritation : Irritating to eyes.

Sensitization

tert-Nonanethiol	:	The results of a test on guinea pigs showed this substance to be a weak skin sensitizer.
tert-Dodecanethiol		The product is a skin sensitizer, sub-category 1B.

Repeated dose toxicity

tert-Nonanethiol	:	Species: Rat, male and female Sex: male and female Application Route: Inhalation Dose: 0, 26, 98 ppm Exposure time: 4 wk Number of exposures: 6 h/d, 5 days/wk Lowest observable effect level: 26 ppm Method: OECD Guideline 412 Target Organs: Kidney, Liver Information given is based on data obtained from similar substances.
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

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.

Reproductive toxicity

tert-Dodecanethiol : Species: Rat
Sex: male

Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 35 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: >= 250 mg/kg
Information given is based on data obtained from similar substances.

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

Developmental Toxicity

tert-Nonanethiol : Species: Rat
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 h/d
Test period: GD 6 - 19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
NOAEL Maternal: >= 88.6 ppm
No adverse effects expected
Information given is based on data obtained from similar substances.

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

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

Sulfole® 100 Mercaptan
Aspiration toxicity : May be harmful if swallowed and enters airways.

CMR effects

tert-Nonanethiol	:	Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Teratogenicity: Animal testing did not show any effects on fetal development.
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

Sulfole® 100 Mercaptan
Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Toxicity to fish

tert-Nonanethiol	:	No data available
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-Nonanethiol	:	EC50: 0,090 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) Immobilization Method: OECD Test Guideline 202
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 algae

tert-Nonanethiol	:	No data available
M-Factor 1,1-dimethylheptanethiol	:	10

Toxicity to bacteria

tert-Dodecanethiol	:	NOEC: 8,6 mg/l Exposure time: 3 h Growth rate Respiration inhibition Method: OECD Test Guideline 209

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

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

tert-Dodecanethiol : NOEC: 0,0108 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
semi-static test
Method: OECD Test Guideline 211
No toxicity at the limit of solubility.

Elimination information (persistence and degradability)

Bioaccumulation

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

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

Ecotoxicology Assessment

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

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

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

Other organisms relevant to the environment
tert-Dodecanethiol : No information available.

Impact on Sewage Treatment
tert-Dodecanethiol : No information available.

Results of PBT assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Additional ecological information : Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

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

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

Product	:	The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

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

SECTION 14: Transport information

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

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

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

NA1993, COMBUSTIBLE LIQUID, N.O.S., (TERT-DODECANETHIOL, TERT-NONANETHIOL), III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (TERT-NONANETHIOL), 9, III, (67 °C), MARINE POLLUTANT, (TERT-NONANETHIOL)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (TERT-NONANETHIOL), 9, III

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

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (TERT-NONANETHIOL), 9, III, (E)

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

UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (TERT-NONANETHIOL), 9, III

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (TERT-NONANETHIOL), 9, III

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

SECTION 15: Regulatory information

National legislation

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

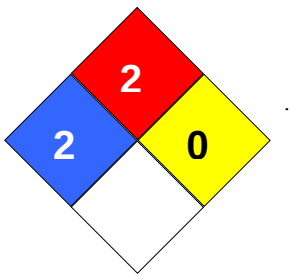
Water contaminating class (Germany) : WGK 3 highly water endangering

Notification status

Europe REACH	:	On the inventory, or in compliance with the inventory
United States of America 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	:	Not in compliance with the inventory
Philippines PICCS	:	On the inventory, or in compliance with the inventory
China IECSC	:	On the inventory, or in compliance with the inventory

SECTION 16: Other information

NFPA Classification : Health Hazard: 2
Fire Hazard: 2
Reactivity Hazard: 0
Health Hazard: 2
Fire Hazard: 2



Further information

Legacy SDS Number : 34660

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

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

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

Key or legend to abbreviations and acronyms used in the safety data sheet			
ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
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.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.

Annex

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

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU3:** Industrial Manufacturing (all)
Process category	:	**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
Environmental release category	:	**ERC1:** Manufacture of substances

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

Environment factors not influenced by risk management

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

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

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

Frequency and duration of use
Exposure duration : < 4 h

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

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

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

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

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

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

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

Frequency and duration of use
Exposure duration : < 1 h

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 80 %)

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

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

Frequency and duration of use
Exposure duration : < 1 h

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

Other operational conditions affecting workers exposure
Outdoor / Indoor : Indoor
Remarks : 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 cm2)

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 95 %)

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

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

Frequency and duration of use
Exposure duration : < 1 h

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

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

Technical conditions and measures

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

3. Exposure estimation and reference to its source

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/m3	0,071
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,02
			Worker – long-term – systemic Combined routes		0,091

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

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)

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

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

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

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

Product characteristics

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

Frequency and duration of use

Exposure duration	:	< 4 h

Human factors not influenced by risk management

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

Other operational conditions affecting workers exposure

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

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

Product characteristics

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

Frequency and duration of use

Exposure duration	:	< 1 h

Human factors not influenced by risk management

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

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor

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 : < 1 h

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

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

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

Frequency and duration of use

Exposure duration : < 15 min

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

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

Technical conditions and measures

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

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

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

Frequency and duration of use
Exposure duration : < 1 h

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

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

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

Frequency and duration of use
Exposure duration : < 1 h

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

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

Technical conditions and measures

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

3. Exposure estimation and reference to its source

Environment

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/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, 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**

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU11:** Manufacture of rubber products
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC6d:** Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
Further information	:	Chain Transfer Agent for the production of styrene butadiene latex for rubber and paper coating, nitrile rubber, acrylonitrile butadiene styrene (ABS) and also for the production of expandable polystyrene.

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

Environment factors not influenced by risk management

Flow rate	:	400.000 m3/d

Other given operational conditions affecting environmental exposure

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 %

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

Product characteristics

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

Frequency and duration of use

Exposure duration	:	< 4 h

Human factors not influenced by risk management

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

Other operational conditions affecting workers exposure

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

Technical conditions and measures

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

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

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

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

Product characteristics

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

Frequency and duration of use

Exposure duration	:	< 4 h

Human factors not influenced by risk management

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

Other operational conditions affecting workers exposure

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

Technical conditions and measures

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

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

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

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific

activity training. (Effectiveness: 80 %)

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

Product characteristics

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

Frequency and duration of use

Exposure duration	:	< 1 h

Human factors not influenced by risk management

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

Other operational conditions affecting workers exposure

Outdoor / Indoor	:	Indoor
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 %)

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

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

Product characteristics

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

Frequency and duration of use

Exposure duration	:	< 15 min

Human factors not influenced by risk management

Exposed skin area	:	Two hands (960 cm2)

Other operational conditions affecting workers exposure

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

Technical conditions and measures

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

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

Product characteristics

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

Frequency and duration of use

Exposure duration	:	< 1 h

Human factors not influenced by risk management

Exposed skin area	:	Two hands (960 cm2)

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

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

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

Frequency and duration of use
Exposure duration : < 1 h

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

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

Technical conditions and measures

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training., Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

3. Exposure estimation and reference to its source

Environment

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

			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)

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

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

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

PROC15: Use as laboratory reagent

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

Not applicable

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

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

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

Environment factors not influenced by risk management

Flow rate	:	400.000 m3/d

Other given operational conditions affecting environmental exposure

Local release to the environment

Emission or Release Factor: Air	:	0,001 %
Emission or Release Factor: Water	:	0,3 %
Emission or Release Factor: Soil	:	0,001 %

Local release rate: Air : 0,025 kg/day
Local release rate: Water : 7,5 kg/day

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

Conditions and measures related to municipal sewage treatment plant
Type of Sewage Treatment Plant : Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent : 10.000 m3/d
Sludge Treatment : Not applicable

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

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

Frequency and duration of use
Exposure duration : < 15 min

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

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

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

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

Frequency and duration of use
Exposure duration : < 15 min

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

Other operational conditions affecting workers exposure

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 cm2)

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, Yes, Respirator with APF of 10 (Effectiveness: 90 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

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

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

Frequency and duration of use
Exposure duration : < 15 min

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, Yes, Respirator with APF of 10 (Effectiveness: 90 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 90 %)

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

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

Frequency and duration of use
Exposure duration : < 15 min

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

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

Technical conditions and measures

Local exhaust ventilation- inhalation:, Yes (Effectiveness: 90 %)
Local exhaust ventilation-dermal:, No (Effectiveness: 0 %)

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, Yes, Respirator with APF of 10 (Effectiveness: 90 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 95 %)

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

Product characteristics

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

Frequency and duration of use
Exposure duration : < 15 min

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, Yes, Respirator with APF of 10 (Effectiveness: 90 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 95 %)

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

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

Frequency and duration of use
Exposure duration : < 15 min

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, Yes, Respirator with APF of 10 (Effectiveness: 90 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. (Effectiveness: 90 %)

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

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

Frequency and duration of use
Exposure duration : < 15 min

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

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

Technical conditions and measures

Local exhaust ventilation- inhalation:, Yes (Effectiveness: 90 %)
Local exhaust ventilation-dermal:, No (Effectiveness: 0 %)

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, Yes, Respirator with APF of 10 (Effectiveness: 90 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Effectiveness: 80 %)

3. Exposure estimation and reference to its source

Environment

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/m3	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/m3	0,012

	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

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	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU2a:** Mining, (without offshore industries)
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Environmental release category	:	**ERC4:** 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

Effectiveness (of a measure) : 96 %

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

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

Frequency and duration of use
Exposure duration : < 4 h

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

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

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

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

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

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

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

Frequency and duration of use
Exposure duration : < 4 h

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)

Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with '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 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 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 cm2)

Other operational conditions affecting workers exposure

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

Technical conditions and measures

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

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

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

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

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

Product characteristics

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

Frequency and duration of use

Exposure duration	:	< 15 min

Human factors not influenced by risk management

Exposed skin area	:	Two hands (960 cm2)

Other operational conditions affecting workers exposure

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

Technical conditions and measures

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

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

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

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

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

Product characteristics

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

Frequency and duration of use

Exposure duration	:	< 1 h

Human factors not influenced by risk management

Exposed skin area	:	Two hands (960 cm2)

Other operational conditions affecting workers exposure

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Eye Protection,Yes,chemically resistant face shield, goggles, or safety glasses with side shields when there is potential for direct contact

Respiratory Protection, No (Effectiveness: 0 %)
Dermal Protection, Yes, Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Effectiveness: 80 %)

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

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

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

			treatment plant			

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

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