2-Mercaptoethanol (BME)

Version 3.5 Revision Date 2016-05-17

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

Product information

Product Name : 2-Mercaptoethanol (BME)
Material : 1017944, 1068852, 1088828, 1086429, 1104362, 1093708, 1086428, 1021562, 1024822, 1021565, 1024821, 1021564, 1028369, 1033065, 1028386, 1028385, 1033120

EC-No.Registration number

Chemical name	CAS-No. EC-No. Index No.	Legal Entity Registration number
2-Mercaptoethanol	60-24-2 200-464-6	Chevron Phillips Chemicals International NV 01-2119517582-41-0000

Relevant Identified Uses Supported : Manufacture
Distribution
Use as an intermediate
Use in polymer production – industrial
Use in Oil and Gas field drilling and production operations - Industrial
Use in Water Treatment Chemicals

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

Acute toxicity, Category 3	H301: Toxic if swallowed.
Acute toxicity, Category 3	H331: Toxic if inhaled.
Acute toxicity, Category 2	H310: Fatal in contact with skin.
Skin irritation, Category 2	H315: Causes skin irritation.
Serious eye damage, Category 1	H318: Causes serious eye damage.
Skin sensitization, Sub-category 1A	H317: May cause an allergic skin reaction.
Specific target organ systemic toxicity - repeated exposure, Category 2 , Heart , Liver	H373: May cause damage to organs through prolonged or repeated exposure if swallowed.
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	:	Danger	
Hazard Statements	:	H301 + H331	Toxic if swallowed or if inhaled.
		H310	Fatal in contact with skin.
		H315	Causes skin irritation.
		H317	May cause an allergic skin reaction.
		H318	Causes serious eye damage.
		H373	May cause damage to organs through prolonged or repeated exposure.

	H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements :

Prevention:	
P260	Do not breathe dust/fume/gas/mist/vapor/spray.
P262	Do not get in eyes, on skin, or on clothing.
P280	Wear protective gloves/ eye protection/ face protection.
Response:	
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor.
P361	Remove/Take off immediately all contaminated clothing.
Storage:	
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.

Hazardous ingredients which must be listed on the label:
- 60-24-2 2-Mercaptoethanol

SECTION 3: Composition/information on ingredients

Synonyms : beta-Mercaptoethanol
BME
Thioglycol
2, Mercaptoethanol
2-Hydroxyethyl Mercaptan
2-Mercaptoethanol Pure

Molecular formula : HSCH2CH2OH

Mixtures

Hazardous ingredients

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
2-Mercaptoethanol	60-24-2 200-464-6	Acute Tox. 3; H301 Acute Tox. 3; H331 Acute Tox. 2; H310 Skin Irrit. 2; H315 Eye Dam. 1; H318 Skin Sens. 1; H317 STOT RE 2; H373 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	99 - 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. Consult a physician. 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	:	Take victim immediately to hospital. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	:	Small amounts splashed into eyes can cause irreversible tissue damage and blindness. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Continue rinsing eyes during transport to hospital. 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	:	68,3 °C (154,9 °F) Method: Tag closed cup
Autoignition temperature	:	295 °C (563 °F) estimated
Suitable extinguishing media	:	Carbon dioxide (CO2).
Unsuitable extinguishing media	:	High volume water jet.
Specific hazards during fire fighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.

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

SECTION 6: Accidental release measures

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

SECTION 7: Handling and storage

Handling

Advice on safe handling	:	Avoid formation of aerosol. Do not breathe vapors/dust. Avoid 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. Provide sufficient air exchange and/or exhaust in work rooms. To avoid spills during handling keep bottle on a metal tray. 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	:	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	:	Prevent unauthorized access. 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

Ingredients with workplace control parameters

LT

Komponentai	Pagrindas, bazė	Verté	Kontrolės parametrai	Pastaba
2-Mercaptoethanol	LT OEL	IPRD	1 mg/m3	

DNEL	:	End Use: Workers Routes of exposure: Skin contact Potential health effects: Chronic effects, Systemic effects Value: 0,6 mg/kg
DNEL	:	End Use: Workers Routes of exposure: Inhalation Potential health effects: Chronic effects, Systemic effects Value: 4 mg/m3
PNEC	:	Fresh water Value: 0,0004 mg/l
PNEC	:	Sea water Value: 0,00004 mg/l
PNEC	:	Fresh water sediment Value: 0,00084 mg/kg
PNEC	:	Soil Value: 0,29175 mg/kg

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:. Full-Face Supplied-Air Respirator. 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. 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:. Personal protection through wearing a tightly closed chemical protection suit and a self-contained breathing apparatus. Flame-resistant clothing. Footwear protecting against chemicals. Rubber apron.

Hygiene measures : Avoid contact with skin, eyes and clothing. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

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	:	Water white
Odor	:	Repulsive

Safety data

Flash point	:	68,3 °C (154,9 °F) Method: Tag closed cup
Lower explosion limit	:	2,3 %(V)
Upper explosion limit	:	18 %(V)
Oxidizing properties	:	no
Autoignition temperature	:	295 °C (563 °F) estimated
Molecular formula	:	HSCH2CH2OH
Molecular weight	:	No data available
pH	:	Not applicable
Pour point	:	No data available
Freezing point		No data available
Boiling point/boiling range	:	155 - 160 °C (311 - 320 °F)
Vapor pressure	:	5,70 MMHG at 37,8 °C (100,0 °F)
Relative density	:	1,12 at 15,6 °C (60,1 °F)

Density	:	1,12 G/ML
Partition coefficient: n-octanol/water	:	Pow: 0,56
Viscosity, dynamic	:	3,42 cP
Relative vapor density	:	2,69 (Air = 1.0)
Evaporation rate	:	1
Percent volatile	:	> 99 %

SECTION 10: Stability and reactivity

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

Possibility of hazardous reactions

Conditions to avoid	:	Heat, flames and sparks.
Materials to avoid	:	May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Other data	:	No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

2-Mercaptoethanol (BME)
Acute oral toxicity : LD50: 133 mg/kg
Species: Rat

2-Mercaptoethanol (BME)
Acute inhalation toxicity : LC50: 2,1 mg/l
Exposure time: 4 h
Species: Rat
Sex: male
Test atmosphere: vapor

2-Mercaptoethanol (BME)
Acute dermal toxicity : LD50: ca. 112 - 224 mg/kg
Species: Rabbit
Sex: male and female

2-Mercaptoethanol (BME)
Skin irritation : Extremely corrosive and destructive to tissue.

2-Mercaptoethanol (BME)

Eye irritation : May cause irreversible eye damage.

2-Mercaptoethanol (BME)
Sensitization : Causes sensitization.

Repeated dose toxicity

2-Mercaptoethanol : Species: Rat, Male and female
Sex: Male and female
Application Route: oral gavage
Dose: 0. 15, 50, 75 mg/kg
Exposure time: 7 wk
Number of exposures: daily
NOEL: 15 mg/kg
Lowest observable effect level: 50 mg/kg
Method: OECD Guideline 422
Target Organs: Heart, Liver

Reproductive toxicity

2-Mercaptoethanol : Species: Rat
Sex: male
Application Route: oral gavage
Dose: 0. 15, 50, 75 mg/kg
Number of exposures: daily
Test period: 7 wks
Method: OECD Guideline 422
NOAEL Parent: 75 mg/kg

Species: Rat
Sex: female
Application Route: oral gavage
Dose: 0. 15, 50, 75 mg/kg
Number of exposures: daily
Test period: 7 wks
NOAEL Parent: 15 mg/kg

Developmental Toxicity

2-Mercaptoethanol : Species: Rat
Application Route: oral gavage
Dose: 5, 15, 25 mg/kg/bw/d
Exposure time: GD 6-19
Number of exposures: daily
Test period: 20 d
Method: OECD Guideline 414
NOAEL Teratogenicity: 25 mg/kg
NOAEL Maternal: 25 mg/kg
Animal testing did not show any effects on fetal development.

CMR effects

2-Mercaptoethanol : Carcinogenicity: Not available
Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Teratogenicity: Not available
Reproductive toxicity: Not available

2-Mercaptoethanol (BME)
Further information : No data available.

SECTION 12: Ecological information

Toxicity to fish

2-Mercaptoethanol : LC50: 37 mg/l
Exposure time: 96 h
Species: Leuciscus idus (Golden orfe)

Toxicity to daphnia and other aquatic invertebrates

2-Mercaptoethanol : EC50: 0,4 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 202

Toxicity to algae

2-Mercaptoethanol : EC50: 19 mg/l
Exposure time: 72 h
Species: Desmodesmus subspicatus (green algae)
static test Method: OECD Test Guideline 201

M-Factor
2-mercaptoethanol : 1

Toxicity to bacteria

2-Mercaptoethanol : EC50: 125 mg/l
Exposure time: 17 h
Growth rate
Species: Pseudomonas putida

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

2-Mercaptoethanol : NOEC: 0,0624 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
static renewal
Method: OECD Test Guideline 211

Bioaccumulation

2-Mercaptoethanol : This material is not expected to bioaccumulate.

Biodegradability

2-Mercaptoethanol : Result: Not readily biodegradable.
< 10 %
Method: OECD Test Guideline 301

Ecotoxicology Assessment

Acute aquatic toxicity 2-Mercaptoethanol	:	Very toxic to aquatic life.
Chronic aquatic toxicity 2-Mercaptoethanol	:	Very toxic to aquatic life with long lasting effects.
Results of PBT assessment 2-Mercaptoethanol	:	Non-classified PBT substance, Non-classified vPvB substance
Additional ecological information	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., 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)
UN2966, THIOGLYCOL, 6.1, II

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN2966, THIOGLYCOL, 6.1, II, (68,3 °C), MARINE POLLUTANT, (THIOGLYCOL)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN2966, THIOGLYCOL, 6.1, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN2966, THIOGLYCOL, 6.1, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN2966, THIOGLYCOL, 6.1, II, ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN2966, THIOGLYCOL, 6.1, II, ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

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

SECTION 15: Regulatory information

National legislation

Chemical Safety Assessment

Ingredients	:	2-mercaptoethanol	A Chemical Safety Assessment has been carried out for this substance.	200-464-6

Major Accident Hazard Legislation

: 96/82/EC Update: 2003
Toxic
2
Quantity 1: 50 t
Quantity 2: 200 t

: 96/82/EC Update: 2003
Dangerous for the environment
9a
Quantity 1: 100 t
Quantity 2: 200 t

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

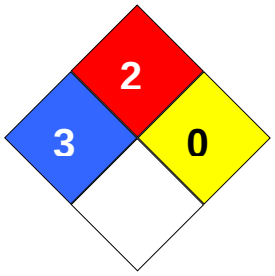
Notification status

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	:	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: 3
Fire Hazard: 2
Reactivity Hazard: 0



Further information

Legacy SDS Number : 26290

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.

H301	Toxic if swallowed.
H310	Fatal in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

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, SU8, SU9:** Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
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) **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	:	**ERC1, ERC4:** Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles
Further information	:	Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities

2.1 Contributing scenario controlling environmental exposure for:ERC1, ERC4: Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles

(Msafe) : 0,108 tonnes/day

Environment factors not influenced by risk management

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

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	300
Emission or Release Factor: Air	:	0,1 %
Emission or Release Factor: Water	:	0,006 %
Emission or Release Factor: Soil	:	0,01 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: > 90 %)
Remarks	:	Prevent discharge of undissolved substance to or recover from wastewater.
Remarks	:	Do not apply industrial sludge to natural soils.
Remarks	:	Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Effectiveness (of a measure)	:	0,2 %

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	During manufacturing no waste of the substance is generated.

Conditions and measures related to external recovery of waste

Recovery Methods	:	During manufacturing no waste of the substance is generated.

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

Product characteristics

Remarks	:	Liquid, vapour pressure < 0.5 kPa at STP

Amount used

Remarks	:	Not applicable

Frequency and duration of use

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

Other operational conditions affecting workers exposure

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

Technical conditions and measures

Ensure operation is undertaken outdoors.

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

Product characteristics

Remarks	:	Liquid, vapour pressure < 0.5 kPa at STP

Amount used

Remarks	:	Not applicable

Frequency and duration of use

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

Other operational conditions affecting workers exposure

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

Technical conditions and measures

Ensure operation is undertaken outdoors.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

2.1 Contributing scenario controlling environmental exposure for:ERC1, ERC4: Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles

2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

ambient temperature, unless stated differently.

Technical conditions and measures
Provide enhanced general ventilation by mechanical means., Provide extraction ventilation at points where emissions occur.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training., Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC1, ERC4	EUSES		Air		0,0229 µg/m3	
			Fresh water		0,303 µg/L	0,758
			Freshwater sediment		0,302 µg/kg	0,926
			Marine sediment		0,0303 µg/kg	0,929
			Soil		0,0120 µg/kg	0,214
			Marine water		0,0304 µg/L	0,761

ERC1: Manufacture of substances
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,57
PROC2, CS2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,70 ppm	0,2
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,63
PROC3, CS37	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,47 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,94
PROC8a, CS14	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,98
PROC8a, CS14	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	2,00 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,96
PROC8b, CS14	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6

			Worker – long-term – systemic Combined routes		0,83
PROC8b, CS14	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	1,50 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,95
PROC9, CS6	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,83
PROC9, CS6	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	1,50 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,95
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,50 ppm	0,9
			Worker – dermal, long-term – systemic	0,07 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,99

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

PROC2: Use in closed, continuous process with occasional controlled exposure
CS2: Process sampling

PROC3: Use in closed batch process (synthesis or formulation)
CS37: Use in contained batch processes

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

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

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

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

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
CS6: Drum and small package filling

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
CS6: Drum and small package filling

PROC15: Use as laboratory reagent

CS36: Laboratory activities

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

Confirm that RMMs and OCs are as described or of equivalent efficiency.

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

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU3, SU8, SU9:** Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
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) **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	:	**:** An environmental exposure assessment is not required for distribution as it is considered within the other exposure scenarios.
Further information	:	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities. Covers injection as odourant in fuel and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

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

Product characteristics

Remarks	:	Liquid, vapour pressure < 0.5 kPa at STP

Amount used

Remarks	:	Not applicable

Frequency and duration of use

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

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

Technical conditions and measures
Ensure operation is undertaken outdoors.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

Technical conditions and measures
Ensure operation is undertaken outdoors.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

Technical conditions and measures
Provide enhanced general ventilation by mechanical means., Provide extraction ventilation at points where emissions occur.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training., Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

2.2 Contributing scenario controlling worker exposure for: PROC8b, PROC9: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,57
PROC2, CS2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,70 ppm	0,2
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,63
PROC3, CS37	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,47 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,94
PROC8a, CS14	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,98
PROC8a, CS14	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	2,00 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined		0,96

			routes		
PROC8b, PROC9, CS6, CS14	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,83
PROC8b, PROC9, CS6, CS14	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	1,50 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,95
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,50 ppm	0,9
			Worker – dermal, long-term – systemic	0,07 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,99

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

PROC2: Use in closed, continuous process with occasional controlled exposure
CS2: Process sampling

PROC3: Use in closed batch process (synthesis or formulation)
CS37: Use in contained batch processes

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

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

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)
CS6: Drum and small package filling
CS14: Bulk transfers

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)
CS6: Drum and small package filling
CS14: Bulk transfers

PROC15: Use as laboratory reagent
CS36: Laboratory activities

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

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

1. Short title of Exposure Scenario: **Use as an intermediate**

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU3, SU8, SU9:** Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
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) **PROC15:** Use as laboratory reagent **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
Environmental release category	:	**ERC6a:** Industrial use resulting in manufacture of another substance (use of intermediates)
Further information	:	Manufacture of the substance or use as an intermediate or process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

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

(Msafe) : 0,0215 tonnes/day

Environment factors not influenced by risk management

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

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	300
Emission or Release Factor: Air	:	0,02 %
Emission or Release Factor: Water	:	0,03 %
Emission or Release Factor: Soil	:	0,1 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: > 80 %)
Water	:	Typical onsite wastewater treatment technology provides removal efficiency of (%): (Effectiveness: 90 %)
Remarks	:	Prevent discharge of undissolved substance to or recover from onsite wastewater.
Remarks	:	Do not apply industrial sludge to natural soils.
Remarks	:	Sludge should be incinerated, contained or reclaimed.

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)	:	0,2 %

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	This substance is consumed during use and no waste of the substance is generated.

Conditions and measures related to external recovery of waste

Recovery Methods	:	This substance is consumed during use and no waste of the substance is generated.

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

Product characteristics

Remarks	:	Liquid, vapour pressure < 0.5 kPa at STP

Amount used

Remarks	:	Not applicable

Frequency and duration of use

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

Other operational conditions affecting workers exposure

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

Technical conditions and measures

Ensure operation is undertaken outdoors.

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

Product characteristics

Remarks	:	Liquid, vapour pressure < 0.5 kPa at STP

Amount used

Remarks	:	Not applicable

Frequency and duration of use

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

Other operational conditions affecting workers exposure

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

Technical conditions and measures
Ensure operation is undertaken outdoors.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

Technical conditions and measures
Provide enhanced general ventilation by mechanical means., Provide extraction ventilation at points where emissions occur.

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

Wear chemically resistant gloves (tested to EN374) in combination with specific activity training., Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

Technical conditions and measures
Ensure operation is undertaken outdoors.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC6a	EUSES		Freshwater		0,316 µg/L	0,789
			Marine water		0,0317 µg/L	0,792
			Freshwater sediment		0,314 µg/kg	0,964
			Marine sediment		0,0315 µg/kg	0,967
			Soil		0,0017 µg/kg	0,0298
			Air		0,0010 µg/m3	

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, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,57
PROC2, CS2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,70 ppm	0,2
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,63
PROC3, CS37	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,47 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,94
PROC8a, CS14	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,98
PROC8a, CS14	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	2,00 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,96
PROC8b, CS14	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,83
PROC8b, CS14	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	1,50 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – dermal, long-term – systemic		0,95
PROC9, CS6	ECETOC TRA	Outdoor	Worker – inhalation,	1,05 ppm	0,3

	Modified		long-term – systemic		
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,83
PROC9, CS6	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	1,50 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,95
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	3,50 ppm	0,9
			Worker – dermal, long-term – systemic	0,07 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,99

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

PROC2: Use in closed, continuous process with occasional controlled exposure
CS2: Process sampling

PROC3: Use in closed batch process (synthesis or formulation)
CS37: Use in contained batch processes

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

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

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

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

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
CS6: Drum and small package filling

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
CS6: Drum and small package filling

PROC15: Use as laboratory reagent
CS36: Laboratory activities

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

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

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

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU3, SU 10:** Industrial Manufacturing (all), Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
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 **PROC5:** Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting; **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) **PROC14:** Production of mixtures or articles by tabletting, compression, extrusion, pelletization; Industrial setting;
Environmental release category	:	**ERC4, ERC6c:** Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of monomers for manufacture of thermoplastics
Further information	:	Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities

2.1 Contributing scenario controlling environmental exposure for:ERC4, ERC6c: Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of monomers for manufacture of thermoplastics

Daily amount per site(Msafe)	:	21,4 kg

Environment factors not influenced by risk management

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

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	300
Emission or Release Factor: Air	:	0,2 %
Emission or Release Factor: Water	:	0,03 %
Emission or Release Factor: Soil	:	0,01 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: > 80 %)
Remarks	:	Prevent discharge of undissolved substance to or recover from onsite wastewater.
Remarks	:	Do not apply industrial sludge to natural soils.
Remarks	:	Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Effectiveness (of a measure)	:	0,2 %

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	This substance is consumed during use and no waste of the substance is generated.

Conditions and measures related to external recovery of waste

Recovery Methods	:	This substance is consumed during use and no waste of the substance is generated.

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

Product characteristics

Remarks	:	Liquid, vapour pressure < 0.5 kPa at STP

Amount used

Remarks	:	Not applicable

Frequency and duration of use

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

Other operational conditions affecting workers exposure

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

Technical conditions and measures

Ensure operation is undertaken outdoors.

2.2 Contributing scenario controlling worker exposure for: PROC2, PROC3: Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation)

Product characteristics

Remarks	:	Liquid, vapour pressure < 0.5 kPa at STP

Amount used

Remarks : Not applicable

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

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

Technical conditions and measures
Ensure operation is undertaken outdoors.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC14: Use in batch and other process (synthesis) where opportunity for exposure arises, Production of mixtures or articles by tabletting, compression, extrusion, pelletization; Industrial setting;

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

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

2.2 Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

differently)

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

2.2 Contributing scenario controlling worker exposure for: PROC6: Calendering operations

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

Technical conditions and measures
Provide extraction ventilation at points where emissions occur.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

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
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

standard of occupational hygiene is implemented.

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

2.2 Contributing scenario controlling worker exposure for: PROC8b, PROC9: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC4, ERC6c	EUSES		Air		0,0077 µg/m3	
			Freshwater		0,253 µg/L	0,633
			Marine water		0,0254 µg/L	0,636
			Freshwater sediment		0,252 µg/kg	0,773
			Marine sediment		0,0253 µg/kg	0,777
			Soil		0,0048 µg/kg	0,0858

ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
ERC6c: Industrial use of monomers for manufacture of thermoplastics

Workers/Consumers

Contributing Scenario	Exposure Assessment	Specific conditions	Value type	Level of Exposure	Risk characterization ratio

	Method				
PROC1, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,57
PROC2, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,70 ppm	0,2
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,63
PROC3, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,07 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,64
PROC4, CS65	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,83
PROC14, CS65	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,50 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,95
PROC5, CS30	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,72
PROC6, CS64	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,00 ppm	0,3
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,71
PROC8a, CS14	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,98
PROC8b, CS14	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,83
PROC9, CS7	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,83

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

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

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

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
CS65: Polymerization (bulk and batch)

PROC14: Production of mixtures or articles by tabletting, compression, extrusion, pelletization; Industrial setting;
CS65: Polymerization (bulk and batch)

PROC5: Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;
CS30: Mixing operations (open systems)

PROC6: Calendering operations
CS64: Calendering (including Banburys)

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

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

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
CS7: Small package filling

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

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

1. Short title of Exposure Scenario: **Use in Oil and Gas field drilling and production operations - Industrial**

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 **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

Environmental release category : **:** There are no expected releases to the environment from this use, so no exposure assessment is made.

Further information :

Oil field well drilling and production operations (including drilling muds and well cleaning) including material transfers, on-site formulation, well head operations, shaker room activities and related maintenance.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

Technical conditions and measures
Ensure operation is undertaken outdoors.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

standard of occupational hygiene is implemented.

Technical conditions and measures
Ensure operation is undertaken outdoors.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

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

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

Technical conditions and measures
Ensure operation is undertaken outdoors.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC8b: Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

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

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

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
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

3. Exposure estimation and reference to its source

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,57
PROC2, CS2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,70 ppm	0,2
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,63
PROC3, CS37	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,07 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,64
PROC4, CS116, PROC8b, CS14	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-	0,34 mg/kg/d	0,6

			term – systemic		
			Worker – long-term – systemic Combined routes		0,83
PROC8a, CS14	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,98

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

PROC2: Use in closed, continuous process with occasional controlled exposure
CS2: Process sampling

PROC3: Use in closed batch process (synthesis or formulation)
CS37: Use in contained batch processes

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
CS116: Drill floor operations
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS14: Bulk transfers

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

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

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

1. Short title of Exposure Scenario: **Use in Water Treatment Chemicals**

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU3, SU 10:** Industrial Manufacturing (all), Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
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 **PROC13:** Treatment of articles by dipping and pouring
Environmental release category	:	**ERC3, ERC4:** Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles
Further information	:	Use in Water Treatment Chemicals

2.1 Contributing scenario controlling environmental exposure for:ERC3, ERC4: Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles

Daily amount per site(Msafe)	:	10 kg

Environment factors not influenced by risk management

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

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	300
Emission or Release Factor: Air	:	5 %
Emission or Release Factor: Water	:	0,2 %
Emission or Release Factor: Soil	:	0 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 0 %)
Remarks	:	Soil emission controls are not applicable as there is no direct release to soil.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent	:	1.000 m3/d
Effectiveness (of a measure)	:	0,2 %

Conditions and measures related to external treatment of waste for disposal

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

Conditions and measures related to external recovery of waste

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

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

Product characteristics

Remarks	:	Liquid, vapour pressure < 0.5 kPa at STP

Amount used

Remarks	:	Not applicable

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

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

Technical conditions and measures
Ensure operation is undertaken outdoors.

2.2 Contributing scenario controlling worker exposure for: PROC2, PROC3: Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation)

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

Technical conditions and measures
Ensure operation is undertaken outdoors.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC8a: Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.

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
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with specific activity training.

2.2 Contributing scenario controlling worker exposure for: PROC13: Treatment of articles by dipping and pouring

Product characteristics
Remarks : Liquid, vapour pressure < 0.5 kPa at STP

Amount used
Remarks : Not applicable

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

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

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with intensive management

supervision controls.

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
ERC3, ERC4	EUSES		Air		0,0953 µg/m3	
			Freshwater		0,17 µg/L	0,426
			Marine water		0,017 µg/L	0,428
			Freshwater sediment		0,169 µg/kg	0,52
			Marine sediment		0,017 µg/kg	0,522
			Soil		0,0462 µg/kg	0,822

ERC3: Formulation in materials
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,57
PROC2, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,70 ppm	0,2
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,63
PROC3, CS37	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,07 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,64
PROC4, CS16	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,45 ppm	0,6
			Worker – dermal, long-term – systemic	0,14 mg/kg/d	0,2
			Worker – long-term – systemic Combined routes		0,84
PROC8a, CS114	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,98
PROC8a, CS114	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	2,00 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,96

PROC8b, CS114	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,83
PROC8b, CS114	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	1,50 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,95
PROC13, CS4	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,98
PROC13, CS4	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	2,00 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,96

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

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

PROC3: Use in closed batch process (synthesis or formulation)
CS37: Use in contained batch processes

PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
CS16: General exposures (open systems)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
CS114: Bulk transfers from tote tanks and supply vessels

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
CS114: Bulk transfers from tote tanks and supply vessels

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS114: Bulk transfers from tote tanks and supply vessels

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS114: Bulk transfers from tote tanks and supply vessels

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

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

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

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