Scentinel® TB Gas Odorant

Version 1.5 Revision Date 2016-06-01

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

Product information

Product Name : Scentinel® TB Gas Odorant
Material : 1119678, 1086437, 1086436, 1103087, 1103086, 1103855, 1024798, 1024799

EC-No.Registration number

Chemical name	CAS-No. EC-No. Index No.	Legal Entity Registration number
Tetrahydrothiophene	110-01-0 203-728-9 613-087-00-0	Chevron Phillips Chemicals International NV 01-2119489799-07-0001
t-Butyl Mercaptan	75-66-1 200-890-2	Chevron Phillips Chemicals International NV 01-2119491288-26-0000

Relevant Identified Uses Supported : Manufacture
Distribution
Formulation
Injection as odorant in fuels – industrial

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

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

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

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)
Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: +800 CHEMCALL (+800 2436 2255) China:+86-21-22157316
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

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

SECTION 2: Hazards identification

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

Flammable liquids, Category 2	H225: Highly flammable liquid and vapor.
Acute toxicity, Category 4	H312: Harmful in contact with skin.
Acute toxicity, Category 4	H332: Harmful if inhaled.
Eye irritation, Category 2	H319: Causes serious eye irritation.
Skin irritation, Category 2	H315: Causes skin irritation.
Skin sensitization, Category 1	H317: May cause an allergic skin reaction.
Chronic aquatic toxicity, Category 2	H411: Toxic to aquatic life with long lasting effects.

Label elements

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal Word : Danger

Hazard Statements	:	H225 Highly flammable liquid and vapor.
		H312 Harmful in contact with skin.
		H315 Causes skin irritation.
		H317 May cause an allergic skin reaction.
		H319 Causes serious eye irritation.
		H332 Harmful if inhaled.
		H411 Toxic to aquatic life with long lasting effects.
Precautionary Statements	:	**Prevention:**
		P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
		P243 Take precautionary measures against static discharge.
		P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage:

P403 + P235 Store in a well-ventilated place. Keep cool.

Hazardous ingredients which must be listed on the label:

- 110-01-0 Tetrahydrothiophene
- 75-66-1 t-Butyl Mercaptan

SECTION 3: Composition/information on ingredients

Synonyms : Scentinel® T-70 Gas Odorant

Molecular formula : Mixture

Mixtures

Hazardous ingredients

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]
Tetrahydrothiophene	**110-01-0** **203-728-9** 613-087-00-0	Flam. Liq. 2; H225 Acute Tox. 4; H302 Acute Tox. 4; H332 Acute Tox. 4; H312 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Aquatic Chronic 3; H412	70
t-Butyl Mercaptan	75-66-1 200-890-2	Flam. Liq. 2; H225 Aquatic Acute 2; H401 Skin Sens. 1; H317 Aquatic Chronic 2; H411	30

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

If inhaled : Call a physician or poison control center immediately. Move to

		fresh air. If unconscious place in recovery position and seek medical advice.
In case of skin contact	:	If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.
In case of eye contact	:	Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point	:	< -17,8 °C (< -0,0 °F) Method: Tagliabue Open Cup
Autoignition temperature	:	No data available
Suitable extinguishing media	:	Dry chemical. Carbon dioxide (CO2). Alcohol-resistant foam.
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. Use only explosion-proof equipment. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.
Hazardous decomposition products	:	Carbon oxides. Sulfur oxides.

SECTION 6: Accidental release measures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to

form explosive concentrations. Vapors can accumulate in low areas.

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).

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

SECTION 7: Handling and storage

Handling

Advice on safe handling : Avoid formation of aerosol. Do not breathe vapors/dust. Avoid 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. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. 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. Use only explosion-proof equipment. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). 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

Chevron Phillips Chemical Company LP

Ingredients	Basis	Value	Control parameters	Note
t-Butyl Mercaptan	Manufacturer	TWA	0,5 ppm,	

DE

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Tetrahydrothiophene	DE TRGS 900	AGW	50 ppm, 180 mg/m3	DFG, H, Y,

DFG Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG (MAK-Kommission)
H Hautresorptiv

Y Ein Risiko der Fruchtschädigung braucht bei Einhaltung des Arbeitsplatzgrenzwertes und des biologischen Grenzwertes (BGW) nicht befürchtet zu werden

CH

Inhaltsstoffe	Grundlage	Wert	Zu überwachende Parameter	Bemerkung
Tetrahydrothiophene	CH SUVA	MAK-Wert	50 ppm, 180 mg/m3	SSc,
	CH SUVA	KZGW	50 ppm, 180 mg/m3	SSc,

SSc Eine Schädigung der Leibesfrucht braucht bei Einhaltung des MAK-Wertes nicht befürchtet zu werden.

Engineering measures

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

Personal protective equipment

Respiratory protection : Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as:. Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Eye wash bottle with pure water. Tightly fitting safety goggles. Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place. Wear as appropriate:. Protective suit. Safety shoes.

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

Physical state	:	Liquid
Color	:	Colorless
Odor	:	Pungent

Safety data

Flash point	:	< -17,8 °C (< -0,0 °F) Method: Tagliabue Open Cup
Lower explosion limit	:	No data available
Upper explosion limit	:	No data available
Oxidizing properties	:	no
Autoignition temperature	:	No data available
Thermal decomposition	:	No data available
Molecular formula	:	Mixture
Molecular weight	:	Not applicable
pH	:	Not applicable
Freezing point	:	No data available
Pour point		No data available
Boiling point/boiling range	:	85 °C (185 °F)
Vapor pressure	:	20,00 mbar at 20 °C (68 °F)
Relative density	:	0,94 at 15,6 °C (60,1 °F)
Water solubility	:	Insoluble
Partition coefficient: n-octanol/water	:	No data available
Viscosity, kinematic	:	No data available
Relative vapor density	:	3,04 (Air = 1.0)
Evaporation rate	:	No data available
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	:	No data available.
Thermal decomposition	:	No data available
Hazardous decomposition products	:	Carbon oxides Sulfur oxides
Other data	:	No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Scentinel® TB Gas Odorant
Acute oral toxicity : Acute toxicity estimate: 2.600 mg/kg
Method: Calculation method

Scentinel® TB Gas Odorant
Acute inhalation toxicity : Acute toxicity estimate: 15 mg/l
Test atmosphere: vapor
Method: Calculation method

Scentinel® TB Gas Odorant
Acute dermal toxicity : Acute toxicity estimate: 1.500 mg/kg
Method: Calculation method

Scentinel® TB Gas Odorant
Skin irritation : May cause skin irritation and/or dermatitis.

Scentinel® TB Gas Odorant
Eye irritation : May cause irreversible eye damage.

Scentinel® TB Gas Odorant
Sensitization : Causes sensitization.

Repeated dose toxicity

Tetrahydrothiophene	:	Species: Rat, Male and female Sex: Male and female Application Route: Inhalation Dose: 0, 51, 236, 1442 ppm Exposure time: 13 wk Number of exposures: 6 h/d, 5 d/wk NOEL: 51 ppm Method: OECD Guideline 413 Target Organs: Upper respiratory tract
t-Butyl Mercaptan		Species: Rat, Male and female

Sex: Male and female
Application Route: Inhalation
Dose: 9, 97, 196 ppm
Exposure time: 13 wks
Number of exposures: 6 hrs/d, 5 d/wk
NOEL: > 196 ppm

Species: Rat, Male and female
Sex: Male and female
Application Route: oral gavage
Dose: 10, 50, 200 mg/kg bw/day
Exposure time: 42-53 days
Number of exposures: Daily
NOEL: 50 mg/kg bw/day
Lowest observable effect level: 200 mg/kg bw/day
Method: OECD Guideline 422

Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 25.1, 99.6, 403.4 ppm
Exposure time: 13 wks
Number of exposures: 6 hrs/d, 5 d/wk
NOEL: 99.6 ppm
Lowest observable effect level: 403.4 ppm
Method: OECD Guideline 413
Target Organs: Liver, Kidney, Blood, Upper respiratory tract
Information given is based on data obtained from similar substances.

Reproductive toxicity

Tetrahydrothiophene : Species: Rat
Sex: male and female
Application Route: Inhalation
Dose: 0, 51, 236, 1442 ppm
Exposure time: 13 wk
Number of exposures: 6 h/d, 5 d/wk
Method: OECD Guideline 413
NOAEL Parent: 1442 ppm
Fertility and developmental toxicity tests did not reveal any effect on reproduction.

t-Butyl Mercaptan Species: Rat
Sex: male and female
Application Route: oral gavage
Dose: 10, 50, 200 mg/kg bw/day
Number of exposures: Daily
Test period: 42 -53 days
Method: OECD Guideline 422
NOAEL Parent: 200 mg/kg bw/day
NOAEL F1: 50 mg/kg bw/day
No adverse effects expected

Developmental Toxicity

Tetrahydrothiophene : Species: Rat
Application Route: Inhalation
Dose: 234, 782, 1910 ppm

	Method: OECD Guideline 414 NOAEL Teratogenicity: 1910 ppm NOAEL Maternal: 234 ppm No adverse effects expected
t-Butyl Mercaptan	Species: Mouse Application Route: Inhalation Dose: 11, 99, 195 ppm Exposure time: GD 6-16 Number of exposures: 6 hrs/d NOAEL Teratogenicity: > = 195 ppm NOAEL Maternal: > = 195 ppm Species: Rat Application Route: Inhalation Dose: 11, 99, 195 ppm Exposure time: GD6-19 Number of exposures: 6 hrs/d NOAEL Teratogenicity: > =195 ppm NOAEL Maternal: > = 195 ppm Species: Rat Application Route: oral gavage Dose: 10, 50, 200 mg/kg bw/day Exposure time: 42-53 days Number of exposures: Daily NOAEL Teratogenicity: 50 mg/kg bw /day NOAEL Maternal: 200 mg/kg bw /day

Scentinel® TB Gas Odorant

Aspiration toxicity : May be harmful if swallowed and enters airways.
Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

CMR effects

Tetrahydrothiophene	: Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Teratogenicity: Animal testing did not show any effects on fetal development. Reproductive toxicity: Animal testing did not show any effects on fertility.
t-Butyl Mercaptan	Carcinogenicity: Not available Mutagenicity: Did not show mutagenic effects in animal experiments. Teratogenicity: Did not show teratogenic effects in animal experiments. Reproductive toxicity: No toxicity to reproduction

Scentinel® TB Gas Odorant

Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Toxicity to fish

Tetrahydrothiophene	:	LC50: > 24 mg/l Exposure time: 96 h Species: Danio rerio (Zebra Fish) Method: OECD Test Guideline 203
t-Butyl Mercaptan		LC50: 34 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) semi-static test Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates

Tetrahydrothiophene	:	EC50: 24 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) Method: OECD Test Guideline 202
t-Butyl Mercaptan		EC50: 6,7 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) static test Method: OECD Test Guideline 202

Toxicity to algae

Tetrahydrothiophene	:	EC50: > 153,2 mg/l Exposure time: 72 h Species: Pseudokirchneriella subcapitata (green algae) Method: OECD Test Guideline 201
t-Butyl Mercaptan		EC50: 24 mg/l Exposure time: 72 h Species: Pseudokirchneriella subcapitata (green algae) Method: OECD Test Guideline 201

Toxicity to bacteria

Tetrahydrothiophene	:	EC50: 1.530 mg/l Exposure time: 3 h Respiration inhibition Method: OECD Test Guideline 209

Elimination information (persistence and degradability)

Bioaccumulation

Tetrahydrothiophene	:	Bioaccumulation is unlikely.
t-Butyl Mercaptan	:	Bioconcentration factor (BCF): 12 Bioaccumulation is unlikely.

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

Ecotoxicology Assessment

Acute aquatic toxicity
t-Butyl Mercaptan : Toxic to aquatic life.

Chronic aquatic toxicity
Tetrahydrothiophene : Harmful to aquatic life with long lasting effects.

t-Butyl Mercaptan : Toxic to aquatic life with long lasting effects.

Results of PBT assessment
Tetrahydrothiophene : Non-classified PBT substance, Non-classified vPvB substance

t-Butyl Mercaptan : 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., 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)
UN3336, MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S., (TETRAHYDROTHIOPHENE, TERTIARY BUTYL MERCAPTAN), 3, II

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN3336, MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S., (TETRAHYDROTHIOPHENE, TERTIARY BUTYL MERCAPTAN), 3, II, (< -17,8 °C), MARINE POLLUTANT, (TERTIARY BUTYL MERCAPTAN)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN3336, MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S., (TETRAHYDROTHIOPHENE, TERTIARY BUTYL MERCAPTAN), 3, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN3336, MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S., (TETRAHYDROTHIOPHENE, TERTIARY BUTYL MERCAPTAN), 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN3336, MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S., (TETRAHYDROTHIOPHENE, TERTIARY BUTYL MERCAPTAN), 3, II, ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN3336, MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S., (TETRAHYDROTHIOPHENE, TERTIARY BUTYL MERCAPTAN), 3, II, ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN)

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	:	tetrahydrothiophene	A Chemical Safety Assessment has been carried out for this substance.	203-728-9
Chemical Safety Assessment				
		2-methylpropane-2-thiol	A Chemical Safety Assessment has been carried out for this substance.	200-890-2

Major Accident Hazard Legislation : 96/82/EC Update: 2003
Highly flammable
7b
Quantity 1: 5.000 t
Quantity 2: 50.000 t

: 96/82/EC Update: 2003

Dangerous for the environment
9b
Quantity 1: 200 t
Quantity 2: 500 t

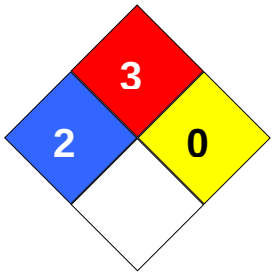
Water contaminating class (Germany) : WGK 3 highly water endangering

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: 2
Fire Hazard: 3
Reactivity Hazard: 0



Further information

Legacy SDS Number : E027

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.

H225	Highly flammable liquid and vapor.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful 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 **PROC3:** Use in closed batch process (synthesis or formulation) **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **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	:	Lead substance(s) EC-No. 203-728-9 EC-No. 200-890-2 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).

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

Product characteristics

Remarks	:	Liquid, vapour pressure 0.5 - 10 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

Handle substance within a closed system., Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)

Organizational measures to prevent /limit releases, dispersion and exposure

Locate bulk storage 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 - 10 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
Handle substance within a closed system., Ensure material transfers are under containment or extract ventilation.

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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 material transfers are under containment or extract ventilation.

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: PROC15: Use as laboratory reagent

Product characteristics

Remarks : Liquid, vapour pressure 0.5 - 10 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

Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.

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

Wear suitable gloves tested to EN374.

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

Product characteristics

Viscosity, dynamic : 1,6 mPa.s at 20 °C

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 : 365
Emission or Release Factor: Water : 0 %
Emission or Release Factor: Soil : 0,01 %
Remarks : Emission or Release Factor: Air : < 0.001 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,9 %)
Remarks : Wastewater emission controls are not applicable as there is no direct release to wastewater.
Remarks : Prevent environmental discharge consistent with regulatory requirements.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2.000 m3/d
Remarks : Not applicable as there is no release to wastewater.

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, PROC3, PROC8b, PROC15: Use in closed process, no likelihood of exposure, Use in closed batch process (synthesis or formulation), Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

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		Freshwater		0,413 ng/L	0,000062
			Marine water		0,0348 ng/L	0,000052
			Freshwater sediment		1,7 ng/kg	0,000146
			Marine sediment		0,143 ng/kg	0,000123
			Soil		0,514 ng/kg	0,000074

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, CS54, CS57	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,03 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,00
PROC1, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	7 ppm	0,1
			Worker – dermal, long-term – systemic	0,03 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,14
PROC3, CS15, CS2, CS55	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,5 ppm	0,1

			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,05
PROC8b, CS14, CS2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,19
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1 ppm	0,0
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,02

PROC1: Use in closed process, no likelihood of exposure
CS15: General exposures (closed systems)
CS54: Continuous process
CS57: no sampling

PROC1: Use in closed process, no likelihood of exposure
CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)
CS15: General exposures (closed systems)
CS2: Process sampling
CS55: Batch process

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS14: Bulk transfers
CS2: Process sampling

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.RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.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.

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:** 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 **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7:** Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems
Further information	:	Lead substance(s) EC-No. 203-728-9 EC-No. 200-890-2 Distribution of Substance: loading (including marine vessel/barge, rail/road car IBC loading), and repacking including drums and small packs of substance, including its distribution and associated laboratory activities.

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 - 10 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 a good standard of general ventilation (not less than 3 to 5 air changes per hour), Handle substance within a closed system.

Organizational measures to prevent /limit releases, dispersion and exposure

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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
Handle substance within a closed system., Ensure operation is undertaken outdoors., Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)

Organizational measures to prevent /limit releases, dispersion and exposure
Locate bulk storage 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 - 10 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
Handle substance within a closed system., Ensure material transfers are under containment or extract ventilation., Ensure samples are obtained under containment or extract ventilation.

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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 material transfers are under containment or extract ventilation.

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

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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
Drain down and flush system prior to equipment opening or maintenance., Limit the substance content in the product to 5 %

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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 material transfers are under containment or extract ventilation., Ensure operation is undertaken outdoors., Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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
Transfer via enclosed lines.

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: PROC15: Use as laboratory reagent

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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

Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.

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

Wear suitable gloves tested to EN374.

2.1 Contributing scenario controlling environmental exposure for:ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7: Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems

Product characteristics

Viscosity, dynamic	:	1,6 mPa.s at 20 °C

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	:	0,01 %
Emission or Release Factor: Water	:	0,001 %
Emission or Release Factor: Soil	:	0,001 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,9 %)
Water	:	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 99,9 %)
Remarks	:	Negligible wastewater emissions as process operates without water contact.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Remarks	:	Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	External treatment and disposal of waste should comply with

applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

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

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), 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, 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), Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

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, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	EUSES		Freshwater		0,107 µg/L	0,016
			Marine water		0,10 µg/L	0,149
			Freshwater sediment		0,44 µg/kg	0,0379
			Marine sediment		0,411 µg/kg	0,354
			Soil		1,63 µg/kg	0,236

ERC1: Manufacture of substances
ERC2: Formulation of preparations
ERC3: Formulation in materials
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
ERC5: Industrial use resulting in inclusion into or onto a matrix
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b: Industrial use of reactive processing aids
ERC6c: Industrial use of monomers for manufacture of thermoplastics
ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7: Industrial use of substances in closed systems

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15, CS54, CS57	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,03 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,00
PROC1, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	7 ppm	0,1
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,2
			Worker – long-term – systemic Combined routes		0,32
PROC2, CS15, CS54, CS56, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	7 ppm	0,1
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,2
			Worker – long-term – systemic Combined routes		0,32
PROC3, CS2, CS15, CS55	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,5 ppm	0,1
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,05
PROC4, CS16	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2 ppm	0,0
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,13
PROC8a, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	1,371 mg/kg/d	0,2
			Worker – long-term – systemic Combined routes		0,28
PROC8b, CS14, CS107	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,19
PROC8b, CS108	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	35 ppm	0,7
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,79
PROC9, CS6	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,19
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1 ppm	0,0
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,0
			Worker – long-term –		0,02

			systemic Combined routes		

PROC1: Use in closed process, no likelihood of exposure
CS15: General exposures (closed systems)
CS54: Continuous process
CS57: no sampling

PROC1: Use in closed process, no likelihood of exposure
CS67: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure
CS15: General exposures (closed systems)
CS54: Continuous process
CS56: with sample collection
CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)
CS2: Process sampling
CS15: General exposures (closed systems)
CS55: Batch process

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
CS39: Equipment cleaning and maintenance

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS14: Bulk transfers
CS107: (closed systems)

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS108: (open systems)

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.RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.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.

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

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**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) **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC2:** Formulation of preparations
Further information	:	Lead substance(s) EC-No. 203-728-9 EC-No. 200-890-2 Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials, transfers, mixing, large and small scale packing, maintenance and associated laboratory activities.

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 - 10 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

Handle substance within a closed system., Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)

Organizational measures to prevent /limit releases, dispersion and exposure

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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
Handle substance within a closed system., Ensure operation is undertaken outdoors., Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)

Organizational measures to prevent /limit releases, dispersion and exposure
Locate bulk storage 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 - 10 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
Handle substance within a closed system., Ensure material transfers are under containment or extract ventilation.

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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 material transfers are under containment or extract ventilation.

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: 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 - 10 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 material transfers are under containment or extract ventilation.

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

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

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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 material transfers are under containment or extract ventilation., Drain down and flush system prior to equipment opening or maintenance.

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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 extraction ventilation at points where emissions occur., Ensure material transfers are under containment or extract ventilation.

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: PROC15: Use as laboratory reagent

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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
Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.

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

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

Product characteristics
Viscosity, dynamic : 1,6 mPa.s at 20 °C

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 : 365
Emission or Release Factor: Air : 0,25 %
Emission or Release Factor: Water : 0,001 %
Emission or Release Factor: Soil : 0,01 %

Technical conditions and measures / Organizational measures
Air : Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,8 %)
Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 99,9 %)
Remarks : Negligible wastewater emissions as process operates without water contact.

Conditions and measures related to municipal sewage treatment plant
Flow rate of sewage treatment plant effluent : 2.000 m3/d
Remarks : Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal
Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste
Recovery Methods : External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;, 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, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

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
ERC2	EUSES		Freshwater		0,0395 µg/L	0,00589
			Marine water		0,0367 µg/L	0,0548
			Freshwater sediment		0,162 µg/kg	0,0140
			Marine sediment		0,151 µg/kg	0,130
			Soil		1,71 µg/kg	0,248

ERC2: Formulation of preparations

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15, CS54, CS57	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,03 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,0
PROC1, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	7 ppm	0,1
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,2
			Worker – long-term – systemic Combined routes		0,32
PROC2, CS15,	ECETOC TRA		Worker – inhalation,	7 ppm	0,1

CS54, CS56, CS67	Modified		long-term – systemic		
			Worker – dermal, long-term – systemic	1,37 mg/kg/d	0,2
			Worker – long-term – systemic Combined routes		0,32
PROC3, CS2, CS15, CS55	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,5 ppm	0,1
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,05
PROC3, CS136	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	10 ppm	0,2
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,2
PROC4, CS16	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2 ppm	0,0
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,13
PROC9, CS6	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,19
PROC5, CS30	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	1,371 mg/kg/d	0,2
			Worker – long-term – systemic Combined routes		0,28
PROC8a, CS22, CS34, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	1,371 mg/kg/d	0,2
			Worker – long-term – systemic Combined routes		0,28
PROC8b, CS8, CS14	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,19
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1 ppm	0,0
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,02

PROC1: Use in closed process, no likelihood of exposure
CS15: General exposures (closed systems)
CS54: Continuous process
CS57: no sampling

PROC1: Use in closed process, no likelihood of exposure
CS67: Storage

PROC2: Use in closed, continuous process with occasional controlled exposure
CS15: General exposures (closed systems)
CS54: Continuous process
CS56: with sample collection
CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)
CS2: Process sampling
CS15: General exposures (closed systems)
CS55: Batch process

PROC3: Use in closed batch process (synthesis or formulation)
CS136: Batch processes at elevated temperatures

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

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

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)

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
CS22: Transfer from/pouring from containers
CS34: Manual
CS39: Equipment cleaning and maintenance

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS8: Drum/batch transfers
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

Confirm that RMMs and OCs are as described or of equivalent efficiency.RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.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.

1. Short title of Exposure Scenario: **Injection as odorant in fuels – 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)

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

Environmental release category : **ERC7:** Industrial use of substances in closed systems

Further information : Lead substance(s)
EC-No. 203-728-9
EC-No. 200-890-2

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, PROC2: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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
Handle substance within a closed system., Ensure material transfers are under containment or extract ventilation.

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 - 10 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
Handle substance within a closed system., Ensure material transfers are under containment or extract ventilation., Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour)

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

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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
Drain down and flush system prior to equipment opening or maintenance., Ensure material transfers are under containment or extract ventilation.

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

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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 material transfers are under containment or extract ventilation.

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: PROC15: Use as laboratory reagent

Product characteristics
Remarks : Liquid, vapour pressure 0.5 - 10 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
Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure.

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

2.1 Contributing scenario controlling environmental exposure for:ERC7: Industrial use of substances in closed systems

Product characteristics
Viscosity, dynamic : 1,6 mPa.s at 20 °C

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 : 365
Emission or Release Factor: Air : 0,25 %
Emission or Release Factor: Water : 0,001 %
Emission or Release Factor: Soil : 0 %

Technical conditions and measures / Organizational measures
Air : Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,8 %)
Water : Treat onsite wastewater (prior to receiving water discharge) to

provide the required removal efficiency of ≥ (%): (Effectiveness: 99,9 %)

Remarks : Soil emission controls are not applicable as there is no direct release to soil.

Remarks : Negligible wastewater emissions as process operates without water contact.

Remarks : Wastewater emissions generated from equipment cleaning with water.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2.000 m3/d

Remarks : Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

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

Conditions and measures related to external recovery of waste

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

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), 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, Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

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
ERC7	EUSES		Freshwater		0,0324 µg/L	0,00484
			Marine water		0,0301 µg/L	0,0449
			Marine sediment		0,124 µg/kg	0,107
			Freshwater sediment		0,133 µg/kg	0,0115
			Soil		1,61 µg/kg	0,233

ERC7: Industrial use of substances in closed systems

Workers/Consumers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio
PROC1, CS15, CS38	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,03 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,00
PROC1, PROC2, CS107, CS38, CS67	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1 ppm	0,0
			Worker – dermal, long-term – systemic	0,137 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,04
PROC3, CS15, CS37	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	2,5 ppm	0,1
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,05
PROC3, CS107, CS37	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	17,5 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,40
PROC8a, CS103, CS39	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	1,371 mg/kg/d	0,2
			Worker – long-term – systemic Combined routes		0,28
PROC8b, CS14	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	0,1372 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,12
PROC8b, CS8	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	5 ppm	0,1
			Worker – dermal, long-term – systemic	0,686 mg/kg/d	0,1
			Worker – long-term – systemic Combined routes		0,19
PROC15, CS36	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1 ppm	0,0
			Worker – dermal, long-term – systemic	0,034 mg/kg/d	0,0
			Worker – long-term – systemic Combined routes		0,02

PROC1: Use in closed process, no likelihood of exposure
CS15: General exposures (closed systems)
CS38: Use in contained systems

PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
CS107: (closed systems)
CS38: Use in contained systems
CS67: Storage

PROC3: Use in closed batch process (synthesis or formulation)
CS15: General exposures (closed systems)
CS37: Use in contained batch processes

PROC3: Use in closed batch process (synthesis or formulation)
CS107: (closed systems)
CS37: Use in contained batch processes

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
CS103: Vessel and container cleaning
CS39: Equipment cleaning and maintenance

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
CS8: Drum/batch 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

Confirm that RMMs and OCs are as described or of equivalent efficiency.RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.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.