



## Tertiary Butyl Mercaptan

Version 1.8

Revision Date 2023-08-14

According to Regulation (EC) No. 1907/2006, Regulation (EC) No. 2020/878

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

#### 1.1 Product identifier

##### Product information

Product Name : Tertiary Butyl Mercaptan  
 Material : 1069500, 1086416, 1086415, 1070007, 1064730, 1021473,  
 1021470, 1017940, 1036143, 1024807, 1021472, 1021471,  
 1024806, 1021469, 1028495, 1021474, 1027458, 1029711,  
 1017329, 1021468

##### EC-No.Registration number

Chemical name	CAS-No. EC-No. Index No.	Legal Entity Registration number
t-Butyl Mercaptan	75-66-1 200-890-2	Chevron Phillips Chemicals International NV 01-2119491288-26-0000

#### 1.2

##### Relevant identified uses of the substance or mixture and uses advised against

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

#### 1.3

##### Details of the supplier of the safety data sheet

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

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

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

**1.4****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: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090

Mexico CHEMTREC 01-800-681-9531 (24 hours)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Argentina: +(54)-1159839431

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

Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)

Belgium: 070 245 245 (24 hours/day, 7 days/week)

Bulgaria: +359 2 9154 233

Croatia: +3851 2348 342 (24 hours/day, 7 days/week)

Cyprus: 1401

Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402

Denmark: Danish Poison Center (Giftlinjen): +45 8212 1212

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

Finland: 0800 147 111 09 471 977 (24 hours/day)

France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)

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

Greece: (0030) 2107793777 (24 hours/day, 7 days/week)

Hungary: +36-80-201-199 (24 hours/day, 7 days/week)

Iceland: 543 2222 (24 hours/day, 7 days/week)

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

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

Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic

Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)

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

Lithuania: +370 (85) 2362052

Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)

Malta: +356 2395 2000

The Netherlands: NVIC: +31 (0)88 755 8000

Norway: 22 59 13 00 (24 hours/day, 7 days/week)

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

Portugal: CIAV phone number: +351 800 250 250

Romania: +40213183606

Slovakia: +421 2 5477 4166

Slovenia: Phone number: 112

Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24 hours/day, 7 days/week)

Sweden: 112 – ask for Poisons Information

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

**SECTION 2: Hazards identification****2.1**

SDS Number:100000013356

2/29

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

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

Flammable liquids, Category 2	H225: Highly flammable liquid and vapor.
Short-term (acute) aquatic hazard, Category 2	H401: Toxic to aquatic life.
Eye irritation, Category 2	H319: Causes serious eye irritation.
Skin sensitization, Category 1	H317: May cause an allergic skin reaction.
Long-term (chronic) aquatic hazard, Category 2	H411: Toxic to aquatic life with long lasting effects.

**2.2****Labeling (REGULATION (EC) No 1272/2008)**

Hazard pictograms	:	  
Signal Word	:	Danger
Hazard Statements	:	H225 Highly flammable liquid and vapor. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H411 Toxic to aquatic life with long lasting effects.
Precautionary Statements	:	<b>Prevention:</b> P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P233 Keep container tightly closed. P273 Avoid release to the environment. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection. <b>Response:</b> P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish. P391 Collect spillage.

Hazardous ingredients which must be listed on the label:

- 75-66-1 t-Butyl Mercaptan

**2.3****Other hazards**

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

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

Endocrine disrupting properties : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

**SECTION 3: Composition/information on ingredients****3.1 - 3.2****Substance or Mixture**

Synonyms : t-Butyl Mercaptan  
tert-Butanethiol  
2-Methyl Propane-2-Thiol  
TBM  
TC4SH  
tert-Butyl Mercaptan

Molecular formula : C<sub>4</sub>H<sub>10</sub>S

**Hazardous ingredients**

Chemical name	CAS-No. EC-No. Index No.	Classification (REGULATION (EC) No 1272/2008)	Concentration [wt%]	Specific Conc. Limits, M-factors and ATEs
t-Butyl Mercaptan	75-66-1 200-890-2	Flam. Liq. 2; H225 Eye Irrit. 2; H319 Skin Sens. 1B; H317 Aquatic Chronic 2; H411	99 - 100	

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

**SECTION 4: First aid measures****4.1****Description of first-aid measures**

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

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

In case of skin contact : If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

**4.2 Most important symptoms and effects, both acute and delayed****Notes to physician**

Symptoms : No data available.

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

Risks : No data available.

**4.3 Indication of any immediate medical attention and special treatment needed**

Treatment : No data available.

**SECTION 5: Firefighting measures**Flash point : -26°C (-15°F)  
estimated

Autoignition temperature : No data available

**5.1****Extinguishing media**Suitable extinguishing media : Alcohol-resistant foam. Carbon dioxide (CO<sub>2</sub>). Dry chemical.

Unsuitable extinguishing media : High volume water jet.

**5.2****Special hazards arising from the substance or mixture**

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

**5.3****Advice for firefighters**

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 a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Hazardous decomposition products : Carbon oxides. Sulfur oxides.

**SECTION 6: Accidental release measures****6.1****Personal precautions, protective equipment and emergency procedures**

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.

**6.2**

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

**Environmental precautions**

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.

**6.3****Methods and materials for containment and cleaning up**

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).

**6.4****Reference to other sections**

Reference to other sections : For personal protection see section 8. For disposal considerations see section 13.

**SECTION 7: Handling and storage****7.1****Precautions for safe handling  
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 a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

**7.2****Conditions for safe storage, including any incompatibilities****Storage**

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

**SECTION 8: Exposure controls/personal protection**

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

**8.1****Control parameters  
Ingredients with workplace control parameters****Chevron Phillips Chemical Company LP**

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

**FR**

Composants	Base	Valeur	Paramètres de contrôle	Note
t-Butyl Mercaptan	FR VLE	VME	0,5 ppm, 1,5 mg/m3	Valeurs limites indicatives,

Valeurs limites  
indicatives

DNEL	:	End Use: Industrial use Routes of exposure: Skin contact Potential health effects: Chronic effects, Systemic effects Value: 2,06 mg/kg
DNEL	:	End Use: Industrial use Routes of exposure: Inhalation Potential health effects: Chronic effects, Systemic effects Value: 14,5 mg/m3
DNEL	:	End Use: Industrial use Routes of exposure: Inhalation Potential health effects: Chronic effects, Local effects Value: 18,6 mg/m3
DNEL	:	End Use: Consumer use Routes of exposure: Ingestion Potential health effects: Chronic effects, Systemic effects Value: 0,74 mg/kg
DNEL	:	End Use: Consumer use Routes of exposure: Inhalation Potential health effects: Chronic effects, Systemic effects Value: 2,57 mg/m3
DNEL	:	End Use: Consumer use Routes of exposure: Inhalation Potential health effects: Chronic effects, Local effects Value: 3,30 mg/m3
PNEC	:	Fresh water Value: 0,0067 mg/l
PNEC	:	Marine water Value: 0,00067 mg/l
PNEC	:	Fresh water sediment Value: 0,0535 mg/kg
PNEC	:	Sea sediment Value: 0,00535 mg/kg
PNEC	:	Soil Value: 0,00718 mg/kg

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

**8.2****Exposure controls****Engineering measures**

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

**Personal protective equipment**

- Respiratory protection : If ventilation or other engineering controls are not adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure, a supplied-air NIOSH approved respirator may be appropriate. If exposure to harmful levels of airborne material may occur, a NIOSH approved respirator that provides protection may be appropriate, such as: Air-Purifying Respirator for Organic Vapors. A positive pressure, air-supplying respirator may be appropriate if there is potential for uncontrolled release, aerosolization, 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.
- 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: Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Footwear protecting against chemicals.
- Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

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

**SECTION 9: Physical and chemical properties****9.1****Information on basic physical and chemical properties****Appearance**

- Form : liquid  
 Physical state : liquid  
 Color : clear

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

Odor : Repulsive  
Odor Threshold : No data available

**Safety data**

Flash point : -26°C (-15°F)  
estimated

Lower explosion limit : No data available

Upper explosion limit : No data available

Flammability (solid, gas) :  
Oxidizing properties : No

Autoignition temperature : No data available

Molecular formula : C<sub>4</sub>H<sub>10</sub>S

Molecular weight : 90,2 g/mol

pH : Not applicable

Pour point : No data available

Melting point/freezing point : No data available

Boiling point/boiling range : 63-65°C (145-149°F)

Vapor pressure : 5,90 PSI  
at 38°C (100°F)

Relative density : 0,81  
at 16 °C (61 °F)

Water solubility : negligible

Partition coefficient: n-  
octanol/water : No data available

Relative vapor density : 3  
(Air = 1.0)

Evaporation rate : 1

Percent volatile : > 99 %

**9.2****Other information**

Conductivity : No data available

**SECTION 10: Stability and reactivity****10.1**

SDS Number:100000013356

9/29

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

**Reactivity** : Stable under recommended storage conditions.

**10.2**

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

**10.3****Possibility of hazardous reactions**

**Hazardous reactions** : Hazardous reactions: Hazardous polymerization does not occur.

Hazardous reactions: Vapors may form explosive mixture with air.

**10.4**

**Conditions to avoid** : Heat, flames and sparks.

**10.6**

**Hazardous decomposition products** : Carbon oxides  
Sulfur oxides

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

**SECTION 11: Toxicological information****11.1****Information on toxicological effects****Acute oral toxicity**

t-Butyl Mercaptan : LD50: 4.729 mg/kg  
Species: Rat  
Sex: male

**Acute inhalation toxicity**

t-Butyl Mercaptan : LC50: 98,3 mg/l  
Exposure time: 4 h  
Species: Rat  
Sex: male and female  
Test atmosphere: vapor  
Method: OECD Test Guideline 403

LC50: 81,9 mg/l  
Exposure time: 4 h  
Species: Rat  
Sex: male  
Test atmosphere: vapor  
Method: OECD Test Guideline 403

LC50: 60,9 mg/l  
Exposure time: 4 h

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

Species: Mouse  
 Sex: male  
 Test atmosphere: vapor  
 Method: OECD Test Guideline 403

**Acute dermal toxicity**

t-Butyl Mercaptan : LD50: > 2.000 mg/kg  
 Species: Rabbit

**Skin irritation**

t-Butyl Mercaptan : No skin irritation

**Eye irritation**

t-Butyl Mercaptan : Mild eye irritation

**Sensitization**

t-Butyl Mercaptan : The product is a skin sensitizer, sub-category 1B.

**Repeated dose toxicity**

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.

**Genotoxicity in vitro**

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

t-Butyl Mercaptan : Test Type: Ames test  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative

Test Type: Mouse lymphoma assay  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: negative

Test Type: Sister Chromatid Exchange Assay  
Metabolic activation: with and without metabolic activation  
Result: negative

**Genotoxicity in vivo**

t-Butyl Mercaptan : Test Type: Mouse micronucleus assay  
Species: Mouse  
Dose: 1250, 2500, 5000 mg/kg  
Method: OECD Test Guideline 474  
Result: negative

**Reproductive toxicity**

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**

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

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

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

**Tertiary Butyl Mercaptan  
Aspiration toxicity  
Toxicology Assessment**

: May be harmful if swallowed and enters airways.

**Tertiary Butyl Mercaptan  
CMR effects**

: Carcinogenicity:  
 Not available  
 Mutagenicity:  
 Tests on bacterial or mammalian cell cultures did not show mutagenic effects.  
 Teratogenicity:  
 Animal testing did not show any effects on fetal development.  
 Reproductive toxicity:  
 Animal testing did not show any effects on fertility.

**11.2****Information on other hazards****Tertiary Butyl Mercaptan  
Further information**

: Symptoms of overexposure are dizziness, headache, tiredness, nausea, unconsciousness, cessation of breathing. Solvents may degrease the skin.

**Endocrine disrupting  
properties**

: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

**SECTION 12: Ecological information****12.1****Toxicity****Toxicity to fish****t-Butyl Mercaptan**

: LC50: 34 mg/l  
 Exposure time: 96 h  
 Species: Oncorhynchus mykiss (rainbow trout)  
 semi-static test Method: OECD Test Guideline 203

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

**Toxicity to daphnia and other aquatic invertebrates**

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**

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

**12.2****Persistence and degradability**

## Biodegradability

t-Butyl Mercaptan : aerobic  
Result: Not readily biodegradable.  
6 %  
Testing period: 63 d  
Method: OECD Test Guideline 301

**12.3****Bioaccumulative potential**

## Bioaccumulation

t-Butyl Mercaptan : Bioconcentration factor (BCF): 12  
Method: QSAR modeled data  
This material is not expected to bioaccumulate.

**12.4****Mobility in soil**

## Mobility

t-Butyl Mercaptan : Method: Calculation, Mackay Level III Fugacity Model  
The product will be dispersed amongst the various  
environmental compartments (soil/ water/ air).

**12.5****Results of PBT and vPvB assessment**

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

**12.6****Endocrine disrupting properties**

Endocrine disrupting properties : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

(EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

**12.7****Other adverse effects**

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

**12.8****Additional Information****Ecotoxicology Assessment**

Short-term (acute) aquatic hazard  
t-Butyl Mercaptan : Toxic to aquatic life.

Long-term (chronic) aquatic hazard  
t-Butyl Mercaptan : Toxic to aquatic life with long lasting effects.

**SECTION 13: Disposal considerations****13.1****Waste treatment methods**

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****14.1 - 14.7****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.

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

**US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)**

UN2347, BUTYL MERCAPTAN, 3, II

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

UN2347, BUTYL MERCAPTAN, 3, II, (-26 °C c.c.), MARINE POLLUTANT, (TERTIARY BUTYL MERCAPTAN)

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**

UN2347, BUTYL MERCAPTAN, 3, II

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

UN2347, BUTYL MERCAPTAN, 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN)

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

33, UN2347, BUTYL MERCAPTAN, 3, II, ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN)

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**

UN2347, BUTYL MERCAPTAN, 3, II, ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN)

**Maritime transport in bulk according to IMO instruments****SECTION 15: Regulatory information****15.1****Safety, health and environmental regulations/legislation specific for the substance or mixture  
National legislation**

Commission Regulation (EU) 2020/878 of 18 June 2020 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

**15.2****Chemical Safety Assessment**

**Components** : 2-methylpropane-2-thiol A Chemical Safety Assessment 200-890-2 has been carried out for this substance.

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

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

: 96/82/EC Update: 2003  
 Dangerous for the environment  
 9b  
 Quantity 1: 200 t  
 Quantity 2: 500 t

: ZEU\_SEVES3 Update:  
 FLAMMABLE LIQUIDS  
 P5c  
 Quantity 1: 5.000 t  
 Quantity 2: 50.000 t

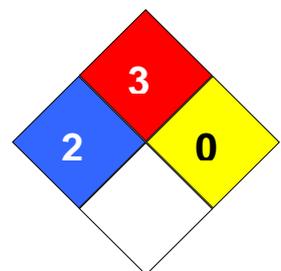
: ZEU\_SEVES3 Update:  
 ENVIRONMENTAL HAZARDS  
 E2  
 Quantity 1: 200 t  
 Quantity 2: 500 t

**Notification status**

Europe REACH	:	This product is in full compliance according to REACH regulation 1907/2006/EC.
Switzerland CH INV	:	On the inventory, or in compliance with the inventory
United States of America (USA) TSCA	:	On or in compliance with the active portion of the TSCA inventory
Australia AIC	:	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	:	All substances in this product were registered, notified to be registered, or exempted from registration by CPChem through an Only Representative according to K-REACH regulations. Importation of this product is permitted if the Korean Importer of Record was included on CPChem's notifications or if the Importer of Record themselves notified the substances.
Philippines PICCS	:	On the inventory, or in compliance with the inventory
Taiwan TCSI	:	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 : 95900

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

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

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%
AIIC	Australian Inventory of Industrial Chemicals	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%	ATE	Acute toxicity estimate

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

H225	Highly flammable liquid and vapor.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

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

Main User Groups	:	<b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	<b>SU3, SU8, SU9:</b> Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category	:	<b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC15:</b> Use as laboratory reagent
Environmental release category	:	<b>ERC1, ERC4:</b> 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****Product characteristics**

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

**Environment factors not influenced by risk management**

Flow rate : 18.000 m<sup>3</sup>/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.

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

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

Flow rate of sewage treatment : 2.000 m3/d  
 plant effluent  
 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 (PEC/PNEC):
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

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

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**

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

Main User Groups	:	<b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	<b>SU3:</b> Industrial Manufacturing (all)
Process category	:	<b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities : Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC15:</b> Use as laboratory reagent
Environmental release category	:	<b>ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7:</b> 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	:	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.

**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

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

**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 (PEC/PNEC):

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

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

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

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	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: <b>SU3, SU 10:</b> Industrial Manufacturing (all), Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process category	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises : PROC 5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) <b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities : Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC15:</b> Use as laboratory reagent
Environmental release category	: <b>ERC2:</b> Formulation of preparations

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

Further information : Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

**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 preparations and articles (multistage and/ or significant contact), Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation**

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

**(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 (PEC/PNEC):
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

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

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: Use as an intermediate**

Main User Groups	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: <b>SU3, SU8, SU9:</b> Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises <b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

	<b>PROC8b:</b> Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
	<b>PROC15:</b> Use as laboratory reagent
Environmental release category	: <b>ERC6a:</b> Industrial use resulting in manufacture of another substance (use of intermediates)
Further information	: Use of substance as an intermediate (not related to Strictly Controlled Conditions). 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)****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 : 0,5 %  
Emission or Release Factor: Water : 1,0 %  
Emission or Release Factor: Soil : 0,1 %

**Technical conditions and measures / Organizational measures**

Air : Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,5 %)  
Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 99 %)  
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, PROC15: Use in closed process, no likelihood of exposure,**

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

**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, 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 (PEC/PNEC):
ERC6a	EUSES		Freshwater		0,178 µg/L	0,0266
			Marine water		0,167 µg/L	0,249
			Freshwater sediment		0,732 µg/kg	0,0631
			Marine water		0,685 µg/kg	0,590
			Soil		2,52 µg/kg	0,364

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

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

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	: <b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	: <b>SU3:</b> Industrial Manufacturing (all)
Process category	: <b>PROC1:</b> Use in closed process, no likelihood of exposure <b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure <b>PROC3:</b> Use in closed batch process (synthesis or formulation) <b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

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 :  
Covers injection as odourant in fuel and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

**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**

**Tertiary Butyl Mercaptan**

Version 1.8

Revision Date 2023-08-14

**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 (PEC/PNEC):
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

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

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.