



## 2-Mercaptoethanol (BME)

Version 5.0

Revision Date 2023-09-27

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 : 2-Mercaptoethanol (BME)  
 Material : 1122450, 1122449, 1017944, 1068852, 1088828, 1086429,  
 1104362, 1093708, 1086428, 1021562, 1024822, 1021565,  
 1024821, 1021564, 1028369, 1033065, 1028386, 1028385,  
 1033120

##### EC-No.Registration number

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

#### 1.2

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

Relevant Identified Uses Supported : Manufacture  
 Use as an intermediate  
 Use in polymer production – industrial

#### 1.3

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

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

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

SDS Requests: (800) 852-5530  
 Responsible Party: Product Safety Group

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

SDS Number:100000013444

2/37

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Acute toxicity, Category 3	H301: Toxic if swallowed.
Acute toxicity, Category 3	H331: Toxic if inhaled.
Acute toxicity, Category 2	H310: Fatal in contact with skin.
Skin irritation, Category 2	H315: Causes skin irritation.
Serious eye damage, Category 1	H318: Causes serious eye damage.
Skin sensitization, Category 1	H317: May cause an allergic skin reaction.
Reproductive toxicity, Category 2	H361: Suspected of damaging fertility or the unborn child.
Specific target organ toxicity - repeated exposure, Category 2	H373: May cause damage to organs through prolonged or repeated exposure.
Short-term (acute) aquatic hazard, Category 1	H400: Very toxic to aquatic life.
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

: H301 + H331	Toxic if swallowed or if inhaled.
H310	Fatal in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements

: <b>Prevention:</b>	
P260	Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P262	Do not get in eyes, on skin, or on clothing.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
<b>Response:</b>	
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
P302 + P352 + P310	IF ON SKIN: Wash with plenty of water. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously

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with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.  
Collect spillage.

P391

**Storage:**

P403 + P233

Store in a well-ventilated place. Keep container tightly closed.

Hazardous ingredients which must be listed on the label:

- 60-24-2 2-Mercaptoethanol

**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.

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

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

Molecular formula

: HSCH<sub>2</sub>CH<sub>2</sub>OH

**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
2-Mercaptoethanol	60-24-2 200-464-6	Acute Tox. 3; H301 Acute Tox. 3; H331 Acute Tox. 2; H310 Skin Irrit. 2; H315 Eye Dam. 1; H318 Skin Sens. 1A; H317 Repr. 2; H361 STOT RE 2; H373 Aquatic Acute 1; H400 Aquatic Chronic 2;	99 - 100	M [Acute]=1

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H411

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. Consult a physician. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.
- If inhaled : If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
- In case of skin contact : Take victim immediately to hospital. If on skin, rinse well with water. If on clothes, remove clothes.
- In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Continue rinsing eyes during transport to hospital. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear. 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.
- 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 : 68,3°C (154,9°F)  
Method: Tag closed cup
- Autoignition temperature : 295°C (563°F)  
estimated

**5.1****Extinguishing media**

- Suitable extinguishing media : Carbon dioxide (CO<sub>2</sub>).
- Unsuitable extinguishing media : High volume water jet.

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**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. Keep away from open flames, hot surfaces and sources of ignition.

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

Personal precautions : Use personal protective equipment. Ensure adequate ventilation.

**6.2****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). Keep in suitable, closed containers for disposal.

**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

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section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. To avoid spills during handling keep bottle on a metal tray. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

Advice on protection against fire and explosion : Do not spray on a naked flame or any incandescent material. 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 : 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.

**7.3****Specific End Use**

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

**SECTION 8: Exposure controls/personal protection****8.1****Control parameters  
Ingredients with workplace control parameters****LT**

Komponentai	Šaltinis	Vertė	Kontrolės parametrai	Pastaba
2-Mercaptoethanol	LT OEL	IPRD	1 mg/m <sup>3</sup>	

DNEL : End Use: Workers  
Routes of exposure: Inhalation  
Potential health effects: Long-term systemic effects  
Value: 0,17 mg/m<sup>3</sup>

DNEL : End Use: Workers  
Routes of exposure: Inhalation  
Potential health effects: Acute systemic effects  
Value: 0,17 mg/m<sup>3</sup>

DNEL : End Use: Workers  
Routes of exposure: Dermal  
Potential health effects: Long-term systemic effects  
Value: 0,05 mg/kg

DNEL : End Use: Workers  
Routes of exposure: Dermal  
Potential health effects: Acute systemic effects

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		Value: 0,05 mg/kg
PNEC	:	Fresh water Value: 0,006 mg/l
PNEC	:	Fresh water sediment Value: 0,024 mg/kg
PNEC	:	Marine water Value: 0,001 mg/l
PNEC	:	Marine sediment Value: 0,002 mg/kg
PNEC	:	Sewage treatment plant Value: 60 mg/l
PNEC	:	Soil Value: 0,908 mg/kg
PNEC	:	Air No hazard identified

**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:. 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.



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- Eye protection : Eye wash bottle with pure water.
- Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate: Flame retardant protective clothing. Personal protection through wearing a tightly closed chemical protection suit and a self-contained breathing apparatus. Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Complete head face and neck protection. Rubber apron. Footwear protecting against chemicals.
- 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****9.1****Information on basic physical and chemical properties****Appearance**

- Form : liquid
- Physical state : liquid
- Color : Water white
- Odor : Repulsive

**Safety data**

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

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Relative density : 1,12  
at 15,6 °C (60,1 °F)

Density : 1.098 kg/m<sup>3</sup>  
at 40°C (104°F)

Partition coefficient: n-  
octanol/water : Pow: 0,56

Viscosity, dynamic : 1,62 cP  
at 40°C (104°F)

Viscosity, kinematic : 1,5 cSt  
at 40°C (104°F)

Relative vapor density : 2,69  
(Air = 1.0)

Evaporation rate : 1

Percent volatile : > 99 %

**9.2****Other information**

Conductivity : No data available

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

**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.

**10.5**

**Materials to avoid** : May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

**10.6**

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

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

2-Mercaptoethanol : LD50: 98 - 168 mg/kg  
Species: Rat  
Sex: male and female  
Method: OECD Test Guideline 401

**Acute inhalation toxicity**

2-Mercaptoethanol : LC50: 625 ppm  
Exposure time: 4 h  
Test atmosphere: gas

**Acute dermal toxicity**

2-Mercaptoethanol : LD50: ca. 112 - 224 mg/kg  
Species: Rabbit  
Sex: male and female

**Skin irritation**

2-Mercaptoethanol : Skin irritation

**Eye irritation**

2-Mercaptoethanol : Irreversible effects on the eye

**Sensitization**

2-Mercaptoethanol : The product is a skin sensitizer, sub-category 1A.

**Repeated dose toxicity**

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

**Genotoxicity in vitro**

2-Mercaptoethanol : Test Type: Ames test  
Method: Mutagenicity (Escherichia coli - reverse mutation assay)

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Result: negative

Test Type: Chromosome aberration test in vitro  
 Method: OECD Guideline 473  
 Result: negative

Test Type: Mouse lymphoma assay  
 Method: OECD Guideline 476  
 Result: negative

Test Type: Sister Chromatid Exchange Assay  
 Result: Ambiguous

**Genotoxicity in vivo**

2-Mercaptoethanol : Test Type: Mouse micronucleus assay  
 Method: Mutagenicity (micronucleus test)  
 Result: negative

**Reproductive toxicity**

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

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

**Developmental Toxicity**

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

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

**Specific Target Organ Toxicity (Repeated Exposure)**

2-Mercaptoethanol : Target Organs: Heart, Liver  
 Assessment: May cause damage to organs through prolonged

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or repeated exposure.

**CMR effects**

2-Mercaptoethanol : 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: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

**11.2****Information on other hazards****2-Mercaptoethanol (BME)**

**Further information** : 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**

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

**Toxicity to daphnia and other aquatic invertebrates**

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

**Toxicity to algae**

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

**M-Factor**

2-mercaptoethanol : M-Factor (Acute Aquat. Tox.) 1

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**Toxicity to bacteria**

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

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**

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

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

## Biodegradability

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

**12.3****Bioaccumulative potential**

## Bioaccumulation

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

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

## Mobility

2-Mercaptoethanol : No data available

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

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

Additional ecological : Very toxic to aquatic life., Toxic to aquatic life with long lasting

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information effects.

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

Short-term (acute) aquatic hazard

2-Mercaptoethanol : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard

2-Mercaptoethanol : 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.

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

UN2966, THIOGLYCOL, 6.1, II

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

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UN2966, THIOGLYCOL, 6.1, II, (68,3 °C c.c.), MARINE POLLUTANT, (THIOGLYCOL)

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**

UN2966, THIOGLYCOL, 6.1, II

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**UN2966, THIOGLYCOL, 6.1, II, (D/E), ENVIRONMENTALLY HAZARDOUS,  
(THIOGLYCOL)**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**

60,UN2966,THIOGLYCOL, 6.1, II, ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

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

UN2966, THIOGLYCOL, 6.1, II, ENVIRONMENTALLY HAZARDOUS, (THIOGLYCOL)

**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)

**Water hazard class** : WGK 3 highly water endangering  
**(Germany)****15.2****Chemical Safety Assessment****Components** : 2-mercaptoethanol A Chemical Safety Assessment 200-464-6  
has been carried out for this  
substance.**Major Accident Hazard** : 96/82/EC Update: 2003  
**Legislation** Toxic  
2  
Quantity 1: 50 t  
Quantity 2: 200 t: 96/82/EC Update: 2003  
Dangerous for the environment  
9a  
Quantity 1: 100 t  
Quantity 2: 200 t

: ZEU\_SEVES3 Update:



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ACUTE TOXIC  
H2  
Quantity 1: 50 t  
Quantity 2: 200 t

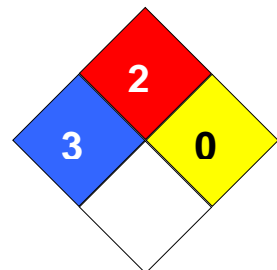
: ZEU\_SEVES3 Update:  
ENVIRONMENTAL HAZARDS  
E1  
Quantity 1: 100 t  
Quantity 2: 200 t

**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
Canada DSL	:	All components of this product are on the Canadian DSL
Australia AIIC	:	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: 3  
Fire Hazard: 2  
Reactivity Hazard: 0

**Further information**

Legacy SDS Number : 26290

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

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

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is

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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.**

H301	Toxic if swallowed.
H310	Fatal in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

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

Main User Groups	:	<b>SU 3:</b> Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	<b>SU3, 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>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities <b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities <b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing) <b>PROC15:</b> Use as laboratory reagent
Environmental release category	:	<b>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**

(Msafe) : 0,108 tonnes/day

**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	:	300
Emission or Release Factor: Air	:	0,1 %
Emission or Release Factor: Water	:	0,006 %
Emission or Release Factor: Soil	:	0,01 %

**Technical conditions and measures / Organizational measures**

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

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

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

**Conditions and measures related to external treatment of waste for disposal**

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

**Conditions and measures related to external recovery of waste**

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

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Ensure operation is undertaken outdoors.

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

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Ensure operation is undertaken outdoors.

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

Wear suitable gloves tested to EN374.

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

**2.1 Contributing scenario controlling environmental exposure for:ERC1, ERC4: Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles****2.2 Contributing scenario controlling worker exposure for: PROC8a, PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities****Product characteristics**

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

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ambient temperature, unless stated differently.

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means., Provide extraction ventilation at points where emissions occur.

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

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

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

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

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

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

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**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		Air		0,0229 µg/m3	
			Fresh water		0,303 µg/L	0,758
			Freshwater sediment		0,302 µg/kg	0,926
			Marine sediment		0,0303 µg/kg	0,929
			Soil		0,0120 µg/kg	0,214
			Marine water		0,0304 µg/L	0,761

ERC1: Manufacture of substances

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

**Workers/Consumers**

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

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

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

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

CS2: Process sampling

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

CS37: Use in contained batch processes

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

CS14: Bulk transfers

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

CS14: Bulk transfers

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

CS14: Bulk transfers

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

CS14: Bulk transfers

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

CS6: Drum and small package filling

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

CS6: Drum and small package filling

PROC15: Use as laboratory reagent



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CS36: Laboratory activities

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

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

**1. Short title of Exposure Scenario: 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>PROC15:</b> Use as laboratory reagent <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
Environmental release category	:	<b>ERC6a:</b> Industrial use resulting in manufacture of another substance (use of intermediates)
Further information	:	Manufacture of the substance or use as an intermediate or process chemical or extraction agent. Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

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

(Msafe) : 0,0215 tonnes/day

**Environment factors not influenced by risk management**

Flow rate	:	18.000 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	:	300
Emission or Release Factor: Air	:	0,02 %
Emission or Release Factor: Water	:	0,03 %
Emission or Release Factor: Soil	:	0,1 %

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**Technical conditions and measures / Organizational measures**

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

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

Type of Sewage Treatment Plant	:	Municipal sewage treatment plant
Flow rate of sewage treatment plant effluent	:	2.000 m <sup>3</sup> /d
Effectiveness (of a measure)	:	0,2 %

**Conditions and measures related to external treatment of waste for disposal**

Waste treatment	:	This substance is consumed during use and no waste of the substance is generated.
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**Conditions and measures related to external recovery of waste**

Recovery Methods	:	This substance is consumed during use and no waste of the substance is generated.
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**2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure****Product characteristics**

Remarks	:	Liquid, vapour pressure < 0.5 kPa at STP
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**Amount used**

Remarks	:	Not applicable
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**Frequency and duration of use**

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently)
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**Other operational conditions affecting workers exposure**

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

Ensure operation is undertaken outdoors.

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

Remarks	:	Liquid, vapour pressure < 0.5 kPa at STP
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**Amount used**

Remarks	:	Not applicable
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**Frequency and duration of use**

Remarks	:	Covers daily exposures up to 8 hours (unless stated differently)
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**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Ensure operation is undertaken outdoors.

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

Wear suitable gloves tested to EN374.

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means., Provide extraction ventilation at points where emissions occur.

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

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

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Ensure operation is undertaken outdoors.

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

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

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

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

Wear suitable gloves tested to EN374.

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**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		0,316 µg/L	0,789
			Marine water		0,0317 µg/L	0,792
			Freshwater sediment		0,314 µg/kg	0,964
			Marine sediment		0,0315 µg/kg	0,967
			Soil		0,0017 µg/kg	0,0298
			Air		0,0010 µg/m3	

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

**Workers/Consumers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
PROC1, CS15	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,01 ppm	0,0
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,57
PROC2, CS2	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	0,70 ppm	0,2
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,63
PROC3, CS37	ECETOC TRA Modified		Worker – inhalation, long-term – systemic	1,47 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,94
PROC8a, CS14	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	2,10 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,98
PROC8a, CS14	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	2,00 ppm	0,5
			Worker – dermal, long-term – systemic	0,27 mg/kg/d	0,5
			Worker – long-term – systemic Combined routes		0,96
PROC8b, CS14	ECETOC TRA Modified	Outdoor	Worker – inhalation, long-term – systemic	1,05 ppm	0,3
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – long-term – systemic Combined routes		0,83
PROC8b, CS14	ECETOC TRA Modified	Indoor	Worker – inhalation, long-term – systemic	1,50 ppm	0,4
			Worker – dermal, long-term – systemic	0,34 mg/kg/d	0,6
			Worker – dermal, long-term – systemic		0,95

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

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

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

CS2: Process sampling

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

CS37: Use in contained batch processes

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

CS14: Bulk transfers

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

CS14: Bulk transfers

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

CS14: Bulk transfers

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

CS14: Bulk transfers

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

CS6: Drum and small package filling

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

CS6: Drum and small package filling

PROC15: Use as laboratory reagent

CS36: Laboratory activities

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

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When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.

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

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

Main User Groups	:	<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	:	<p><b>PROC1:</b> Use in closed process, no likelihood of exposure</p> <p><b>PROC2:</b> Use in closed, continuous process with occasional controlled exposure</p> <p><b>PROC3:</b> Use in closed batch process (synthesis or formulation)</p> <p><b>PROC4:</b> Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p><b>PROC5:</b> Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)</p> <p><b>PROC8a:</b> Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p><b>PROC8b:</b> Transfer of substance or preparation (charging/discharging) from/ to vessels/ large containers at dedicated facilities</p> <p><b>PROC9:</b> Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p><b>PROC14:</b> Production of preparations or articles by tableting, compression, extrusion, pelletization</p>
Environmental release category	:	<b>ERC4, ERC6c:</b> Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use of monomers for manufacture of thermoplastics
Further information	:	Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities

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

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

**Environment factors not influenced by risk management**

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

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**Other given operational conditions affecting environmental exposure**

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

**Technical conditions and measures / Organizational measures**

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

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

Flow rate of sewage treatment plant effluent : 2.000 m<sup>3</sup>/d  
 Effectiveness (of a measure) : 0,2 %

**Conditions and measures related to external treatment of waste for disposal**

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

**Conditions and measures related to external recovery of waste**

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

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Ensure operation is undertaken outdoors.

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**



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Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Ensure operation is undertaken outdoors.

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

Wear suitable gloves tested to EN374.

**2.2 Contributing scenario controlling worker exposure for: PROC4, PROC14: Use in batch and other process (synthesis) where opportunity for exposure arises, Production of preparations or articles by tableting, compression, extrusion, pelletization****Product characteristics**

Remarks : Liquid, vapour pressure &lt; 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

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

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

**2.2 Contributing scenario controlling worker exposure for: PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)****Product characteristics**

Remarks : Liquid, vapour pressure &lt; 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

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**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

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

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

**2.2 Contributing scenario controlling worker exposure for: PROC6: Calendering operations****Product characteristics**

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Provide extraction ventilation at points where emissions occur.

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

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

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

Remarks : Liquid, vapour pressure < 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

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**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

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

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

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

Remarks : Liquid, vapour pressure &lt; 0.5 kPa at STP

**Amount used**

Remarks : Not applicable

**Frequency and duration of use**

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

**Other operational conditions affecting workers exposure**

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

**Technical conditions and measures**

Provide enhanced general ventilation by mechanical means.

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

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

**3. Exposure estimation and reference to its source****Environment**

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

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

ERC6c: Industrial use of monomers for manufacture of thermoplastics

**Workers/Consumers**

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value type	Level of Exposure	Risk characterization ratio (PEC/PNEC):
PROC1, CS15	ECETOC TRA		Worker – inhalation,	0,01 ppm	0,0

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

PROC1: Use in closed process, no likelihood of exposure

CS15: General exposures (closed systems)

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

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

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

PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletization  
CS65: Polymerization (bulk and batch)

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

PROC6: Calendering operations  
CS64: Calendering (including Banburys)

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

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

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

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

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When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.

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