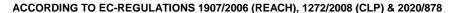
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**ETBE V4020** 

#### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name 2-ethoxy-2-methylpropane / ETHYL TERT-BUTYL ETHER

Product description V4020-ETBE-2-ethoxy-2-methylpropane / ETHYL TERT-BUTYL ETHER

Trade Name ETBE
Product code V4020, ETBE

CAS No. 637-92-3 EC No. 211-309-7

REACH Registration No. 01-2119452785-29-xxxx

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

and uses advised agains

Page: Identified use(s) No **Exposure Scenario** 1 Transport and Distribution 10 Formulation 2 13 3 Use as a fuel (Industrial) 16 4 Use as a fuel (Professional) 19 Use as a fuel (Consumer) 22

Uses advised against Anything other than the above.

1.3 Details of the supplier of the safety data sheet

Company Identification Vitol SA

Place des Bergues 3 1201 Geneva Switzerland +31 10 498 7200 +31 10 452 9545 xreach@vitol.com

1.4 Emergency Telephone Number

E-mail (competent person)

Telephone Fax

Emergency Phone No. +44 (0) 1235 239 670, 24/7 Language(s) spoken: All official European languages.

### **SECTION 2: HAZARDS IDENTIFICATION**

2.1 Classification of the substance or mixture

**2.1.1 Regulation (EC) No. 1272/2008 (CLP)** Flam. Liq. 2; H225

STOT SE 3; H366 (Central nervous system, Inhalation)

2.2 Label elements According to Regulation (EC) No. 1272/2008 (CLP)

Product description V4020-ETBE-2-ethoxy-2-methylpropane / ETHYL TERT-BUTYL ETHER

Hazard Pictogram(s)





Signal Word(s) DANGER

Hazard Statement(s) H225: Highly flammable liquid and vapour.

H336: May cause drowsiness or dizziness. Central nervous system, Inhalation

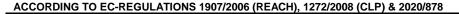
Precautionary Statement(s) P210: Keep away from heat, hot surfaces, sparks, open flames and other

ignition sources. No smoking.

P243: Take precautionary measures against static discharge.

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**ETBE V4020** 

P261: Avoid breathing vapours.

P271: Use only outdoors or in a well-ventilated area.

P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for

and confined spaces. Releases flammable vapors below normal ambient

breathing.

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

May form explosive mixture with air. The vapour is heavier than air; beware of pits

temperatures.

Other hazards

# SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1 Substances

SUBSTANCE	CAS No.	EC No.	%W/W
Tert-Butyl Methyl Ether	1634-04-4	216-653-1	100

#### SECTION 4: FIRST AID MEASURES



2.3

#### 4.1 Description of first aid measures

Self-protection of the first aider

Inhalation

Skin contact

Eye contact

Ingestion

4.2 Most important symptoms and effects, both acute and delayed

4.3 Indication of any immediate medical attention and special treatment needed

Notes to a physician:

The vapour is heavier than air; beware of pits and confined spaces. If it is suspected that fumes are still present, the responder should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Avoid all contact. Do not ingest. If swallowed then seek immediate medical assistance.

IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical advice/attention if you feel unwell.

IF ON SKIN (or hair): Remove contaminated clothing immediately and wash affected skin with plenty of water or soap and water. If irritation (redness, rash, blistering) develops, get medical attention.

IF IN EYES: Flush eyes with water for at least 15 minutes while holding eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.

IF SWALLOWED: Do not induce vomiting because of risk of aspiration into the lungs. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Do not give anything by mouth to an unconscious person. Get medical attention immediately.

Irritation of the respiratory tract. Coughing, Wheezing. Causes skin irritation. Ingestion may cause irritation of the gastrointestinal tract.

IF SWALLOWED: Do NOT induce vomiting, if vomiting does occur, have victim lean forward to reduce risk of aspiration. Treat symptomatically.

In case of ingestion the stomach should be emptied by gastric lavage under qualified medical supervision. At high doses, effects on the CNS are possible.

### **SECTION 5: FIREFIGHTING MEASURES**

#### 5.1 Extinguishing media

Suitable extinguishing media

Unsuitable extinguishing media

5.2 Special hazards arising from the substance or mixture

Extinguish with sand or dry chemical. Foam, Carbon dioxide, Water fog or dry powder

Do not use water jet. Direct water jet may spread the fire.

Releases flammable vapors below normal ambient temperatures. Prevent liquid entering sewers, basements and any watercourses. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback.

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5.3 Advice for firefighters

Fight fire with normal precautions from a reasonable distance. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire. Avoid release to the environment. Dike fire control water for later disposal.

### **SECTION 6: ACCIDENTAL RELEASE MEASURES**

6.1 Personal precautions, protective equipment and emergency procedures Caution - spillages may be slippery. Eliminate sources of ignition. No open flames, no sparks and no smoking. Stop leak if safe to do so. Ensure suitable personal protection during removal of spillages. Avoid all contact. Keep upwind. The vapour is heavier than air; beware of pits and confined spaces.

6.2 Environmental precautions

Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body.

6.3 Methods and material for containment and cleaning up

Highly flammable. Adsorb spillages onto sand, earth or any suitable adsorbent material. Use non-sparking equipment when picking up flammable spill. Ensure that the equipment is adequately grounded. Sweep up and shovel into waste drums or plastic bags. Transfer to a lidded container for disposal or recovery.

6.4 Reference to other sections

See Section: 8,13

#### **SECTION 7: HANDLING AND STORAGE**

7.1 Precautions for safe handling

Keep away from sources of ignition. - No smoking. Use only outdoors or in a well-ventilated area. Prevent vapour build up by providing adequate ventilation during and after use. Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazards. Take action to prevent static discharges. Use non-sparking tools. Ground/bond container and receiving equipment. The vapour is heavier than air; beware of pits and confined spaces. Avoid all contact with substance. Do not ingest. Do not breathe vapour. Use personal protective equipment as required. See Section: 8. Keep good industrial hygiene. Wash hands thoroughly after handling. Contaminated clothing should be thoroughly cleaned.

Maintenance

7.2

7.3

Observe precautions pertaining to confined space entry. Isolate, vent, drain, wash and purge systems or equipment before maintenance or repair.

Conditions for safe storage, including any

incompatibilities

Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazards. Bund storage facilities to prevent soil and water pollution in the event of spillage. Keep only in original packaging. Keep containers properly sealed when not in use. Protect from sunlight. Containers of this material may be hazardous when empty since they retain product residue. Containers must not be punctured or destroyed by burning, even when empty.

Storage temperature Storage measures

Specific end use(s)

Keep only in the original container.

Suitable material: Mild steel, Carbon Steel

Stable at ambient temperatures.

Incompatible materials Keep away from oxidising agents.

See Section: 1.2 and/or Exposure Scenario

#### SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational exposure limits Not established

8.1.2 Biological limit value Not established

8.1.3 PNECs and DNELs

DNEL ETBE	Oral (mg/kg bw/day)	Inhalation (mg/m³)	Dermal (mg/kg bw/day)
Industry- Long Term - Systemic effects	-	352	6767
Industry- Short term - Systemic effects	_	2800	_

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#### ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

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Industry- Short term - Local effects	-	105	-
Consumer - Long Term - Systemic effects	6	105	4060
Consumer - Long Term - Systemic effects	-	1680	-
Consumer - Long Term - Local effects	-	63	-

PNEC	ETBE	
Aquatic Compartment	PNEC aquatic, freshwater 0.51 mg/L	
	PNEC aquatic, marine water 0.017 mg/L	
	PNEC aquatic, intermittent release 11 mg/L	
	PNEC STP 12.5 mg/L	
	PNEC sediment, freshwater 2.86 mg/kg sediment dw	
	PNEC sediment, marine water 0.078 mg/kg sediment dw	
Terrestrial Compartment	PNEC soil 0.274 mg/kg soil dw	

8.2 **Exposure controls** 

8.2.1 Appropriate engineering controls Ensure adequate ventilation. Guarantee that the eye flushing systems and safety

showers are located close to the working place.

Individual protection measures, such as personal 8.2.2

protective equipment

Fuels are typically used, transferred and transported in closed systems. If exposure is likely (i.e. during sampling) the following advice may be appropriate.

Good hygiene practices and housekeeping measures.

Refer to annexes for exposure scenarios detailing use specific exposure controls.

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Eye/ face protection

Wear eye protection with side protection (EN166).



Skin protection



Hand protection: Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.

Body protection: Fire retardant clothing is appropriate for routine occupational use.

Respiratory protection



In case of insufficient ventilation, wear suitable respiratory equipment.

High concentrations/Aerosol or mist formation. Wear suitable respiratory protection (conforming to EN140 with Type A filter or better) and gloves (type EN374) if regular skin contact likely.

Thermal hazards Not applicable

8.2.3 **Environmental exposure controls** Avoid release to the environment.

#### SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

> Physical state Liquid

Colour

Odour Not defined Melting point/freezing point - 94 °C 73 °C

Boiling point or initial boiling point and boiling range

Flammability

Lower and upper explosion limit

Flash point

Colourless to yellowish liquid.

Highly flammable liquid and vapour.

Not established

- 19 °C

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Auto-ignition temperature 375 °C

Decomposition temperature Not established pH Not established Kinematic viscosity 0.53 mm²/s at 40 °C

Solubility Water: 2.37 g/ 100 g at 20 °C

Partition coefficient: n-octanol/water (log value) log P: 1.28

Vapour pressure 12.8 kPa at 20°C

Density and/or relative density 0.75 g/cm³ at 20 °C

Relative vapour density Not established

Particle characteristics Not established

**9.2 Other information** Vapour may create explosive atmosphere.

Upper/lower flammability or explosive limits Flammable Limits (Upper) (%v/v): 7.7 Flammable Limits (Lower) (%v/v): 1.23

#### **SECTION 10: STABILITY AND REACTIVITY**

10.1 Reactivity Stable under normal conditions. Reacts with - Strong oxidising agents

10.2 Chemical stability Stable under normal conditions.

10.3 Possibility of hazardous reactions None known

10.4 Conditions to avoid Contact with strong acids can decompose this material and create extremely

flammable isobutylene.

10.5 Incompatible materials Acids. Keep away from oxidising agents.
 10.6 Hazardous decomposition products Carbon monoxide, Carbon dioxide

#### SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on hazard classes as defined in

Regulation (EC) No 1272/2008

Acute toxicity - Ingestion

Based upon the available data, the classification criteria are not met.

LD50 (oral,rat) mg/kg: >2000 (OECD 401)

Acute toxicity - Inhalation Based upon the available data, the classification criteria are not met.

Estimated LD50 Vapour > 20 mg/l

**Acute toxicity - Skin contact**Based upon the available data, the classification criteria are not met.

LD50 (skin,rabbit) mg/kg: >2000 (OECD 402)

**Skin corrosion/irritation**Based upon the available data, the classification criteria are not met.

Mean erythema score: 0.67 (rabbit) (OECD 404) Mean edema score: 0.11 (rabbit) (OECD 404)

**Serious eye damage/irritation**Based upon the available data, the classification criteria are not met.

Not irritating to eyes. (rabbit) (OECD 405)

**Respiratory or skin sensitisation**Based upon the available data, the classification criteria are not met.

Sensitisation (guinea pig) - Negative (OECD 406)

Germ cell mutagenicity Based upon the available data, the classification criteria are not met.

In vitro – Negative (OECD 476)

Carcinogenicity Based upon the available data, the classification criteria are not met.

Carcinogenicity - Negative (rat) (OECD 453)

Reproductive toxicity Based upon the available data, the classification criteria are not met.

Reproductive toxicity: Negative (rat) (OECD 416) Developmental toxicity: Negative (rat) (OECD 414)

STOT - Single Exposure STOT SE 3; May cause drowsiness and dizziness. (Central nervous system,

Inhalation)

STOT - Repeated Exposure Based upon the available data, the classification criteria are not met.

Negative (rat) (OECD 415)

Aspiration hazard Based upon the available data, the classification criteria are not met.

11.2 Information on other hazards

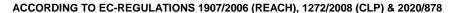
11.2.1 Endocrine disrupting properties This product does not contain a substance that has endocrine disrupting

properties with respect to humans as no components meets the criteria.

11.2.2 Other information None known

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#### **SECTION 12: ECOLOGICAL INFORMATION**

12.1	Toxicity	Based upon the available data, the classification criteria are not met.
		NOEC: 64 mg/l freshwater (Zebra fish) OECD 212
12.2	Persistence and degradability	Readily biodegradable (according to OECD criteria).
12.3	Bioaccumulative potential	The substance has low potential for bioaccumulation.
12.4	Mobility in soil	The product is predicted to have moderate mobility in soil. Slightly soluble in:
		Water
12.5	Results of PBT and vPvB assessment	Not classified as PBT or vPvB. None of the substances in this product fulfil the
		criteria for being regarded as a PBT or vPvB substance.
12.6	Endocrine disrupting properties	This product does not contain a substance that has endocrine disrupting
		properties with respect to humans as no components meets the criteria.
12.7	Other adverse effects	None known

#### **SECTION 13: DISPOSAL CONSIDERATIONS**

13.1 Waste treatment methods Dispose of this material and its container as hazardous waste. Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point. Disposal should be in accordance with local, state or national legislation. Containers of this material may be hazardous when empty since they retain product residue. Containers must not be punctured or destroyed by burning, even when empty. Allocation of a waste code number, according to the European Waste Catalogue, should be carried out in agreement with the regional waste disposal company. Waste code: 16 05 06, 16 05 08\* HP3

Waste classification according to Directive 2008/98/EC

(Waste Framework Directive)

### **SECTION 14: TRANSPORT INFORMATION**

14.1	UN number or ID number	ADR/RID UN 1179	IMDG/ADN UN 1179
14.2	UN proper shipping name	ETHYL BUTYL ETHER	ETHYL BUTYL ETHER
14.3	Transport hazard class(es)	3	3
14.4	Packing group	II	II
14.5	Environmental hazards	Not classified	Not classified as a Marine Pollutant.
14.6	Special precautions for user	See Section: 2	
14.7	Maritime transport in bulk according to IMO instruments	No information available.	No information available.
14.8	Additional information	HIN: 30 Tunnel Code: 3 (D/E) Limited Quantity: 5L	EmS: F-E, S-E Limited Quantity: 5L

#### **SECTION 15: REGULATORY INFORMATION**

15.1	Safety, health and environmental
	regulations/legislation specific for the substance or
	mixture
15.1.1	EU regulations

Seveso Upper Tier: 25000 tonnes Lower Tier: 2500 tonnes

15.1.2 National regulations

15.2 **Chemical Safety Assessment**  Water hazard class: 1

This safety data sheet contains more than one ES in an integrated form. Contents of the exposure scenarios have been included into sections 1.2, 8, 9, 12, 15 and

16 of this safety data sheet.

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ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



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#### **SECTION 16: OTHER INFORMATION**

The following sections contain revisions or new statements: New SDS Regulation 2020/878 format, all sections have been updated to include new information. Please review SDS with care.

#### References:

Existing Safety Data Sheet (SDS).

Existing ECHA registration(s) for ETBE (CAS No. 637-92-3) and Chemical Safety Report.

EU Classification: This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

Legend

ADR ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

CAS Chemical Abstracts Service

CLP Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures

EC European Community
ECHA European Chemicals Agency

EU European Union
DNEL Derived no effect level

IATA IATA: International Air Transport Association
ICAO ICAO: International Civil Aviation Organization
IMDG IMDG: International Maritime Dangerous Goods

LC50 Lethal Concentration at which 50% of the population is killed

LD50 Lethal Dose at which 50% of the population is killed

NOEC No Observed Effect Concentration

OECD Organisation for Economic Cooperation and Development

PBT PBT: Persistent, Bioaccumulative and Toxic

PNEC Predicted No Effect Concentration

REACH Registration, Evaluation, Authorisation and Restriction of Chemicals

RID: Regulations concerning the international railway transport of dangerous goods

UN United Nations

vPvB vPvB: very Persistent and very Bioaccumulative

#### Hazard classification / Classification code:

Flam. Liq. 2; Flammable liquid, Category 2

STOT SE 3; Specific Target Organ Toxicity — Single Exposure,

Category 3

### Hazard Statement(s)

H225: Highly flammable liquid and vapour. H336: May cause drowsiness or dizziness.

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

#### Disclaimers

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#### Annex to the extended Safety Data Sheet (eSDS)

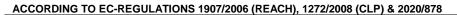
See below -

2-ethoxy-2-methylpropane

CAS No. 637-92-3

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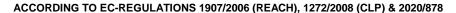
EINECS No. 211-309-7

### **Summary of Parameters**

Physical Param	Physical Parameters				
Vapour pressure	(hPa)		170 (Liquid with high volatility.)		
Partition Coefficient (log Kow)			1.48		
Aqueous solubility (mg/l)			16,400		
Molecular weight	t		102.18		
Biodegradability			Inherently biodegradable, not fulfilling criteria		
Human Health (	DNEL)				
	<b>Q</b> 1	Inhalation (mg/m³)	2800 (= 667 ppm)		
	Short term	Dermal (mg/kg bw/day)	Non-toxic		
Workers	Long Term	Inhalation (mg/m³)	352 (Systemic effects) 105 (Local effects)		
	Long reim	Dermal (mg/kg bw/day)	6767		
		Inhalation (mg/m³)	1680 (Acute) 105 (long-term, Systemic effects ) 63 (long-term,Local effects)		
Consumer		Dermal (mg/kg bw/day)	4060		
		Oral (mg/kg bw/day)	12.5		
Environmental Parameters					
Sewage Treatment Plant (STP) (mg/l)			12.5		
	freshwater (mg/l)		0.51		
marine water(mg/l)			0.017		
freshwater sediment (mg/kg wet weight)		nt)	28.5		
marine sediment	marine sediment (mg/kg wet weight)		1.45		
soil (mg/kg wet weight)			2.41		

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#### Contents

Number	Title	Page:
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Exposure scenario 2	Formulation	13
Exposure scenario 3	Use as a fuel (industrial)	16
Exposure scenario 4	Use as fuel (professional)	19
Exposure scenario 5	Use as a fuel (consumer)	22

#### **Contributing Scenarios**

#### **PROC Codes**

PROC1 Use in closed process, no likelihood of exposure

PROC2 Use in closed, continuous process with occasional controlled exposure

(Storage) Bulk storage with occasional sampling from dedicated sample point

PROC3 Use in closed batch process (synthesis or formulation)

(Sampling) with sample collection

(Elevated) Operation is carried out at elevated temperature (> 20°C above ambient temperature).

PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises

PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

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

(Maintenance) Equipment cleaning and maintenance

(Manual) Manual transfer/pouring from containers

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

(bulk closed) Bulk open loading (e.g. road/rail car top loading)

(bulk open) Bulk open loading (e.g. road/rail car top loading)

(Drum) Drum or batch transfers with dedicated equipment

(bulk) Bulk transfer in a closed system

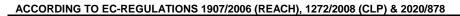
(Refuelling) Refuelling vehicles, light aircraft or marine craft.

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

PROC15 Use as laboratory reagent

PROC16 Using material as fuel sources, limited exposure to unburned product to be expected

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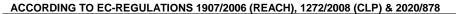
### Exposure Scenario 1 – Transport and Distribution

1.0 Contributing Scenarios	
Sector of uses SU	3
Process category [PROC]	1, 2, 2 (Storage), 3, 3 (Sampling), 4, 8a (maintenance), 8b (bulk closed), 8b (bulk open), 8b (Drum), 9, 15
Chemical product category [PC]	not applicable
Article Categories [AC]	not applicable
Environmental release categories [ERC]	1, 2
Specific Environmental Release Categories SPERC	ESVOC3 SpERC

2.1 Control of worker exposure				
Product characteristics				
Physical form of product	Liquid with low volatility.	Liquid with low volatility.		
Concentration of substance in product	Covers concentrations up to 100%			
Human factors not influenced by risk	management			
Potential exposure area	Not defined			
Frequency and duration of use				
	PROC3 (Sampling)	Covers exposure up to 15 minutes		
	PROC2 (Storage), PROC8b	Covers exposure up to 1 hour		
Exposure duration per day	(bulk closed),	Covers exposure up to 1 hour		
Exposure duration per day	8b (bulk open), 8a (Maintenance)	Covers exposure up to 4 hours		
	All other PROC's	Covers exposure up to 8 hours		
Other operational conditions affecting	g worker exposure	<u> </u>		
Area of use	PROC2, PROC8b (bulk closed),	Outdoor		
	All other PROC's	Indoor		
	All other rivous	maddi		
<b>General measures applicable to all ad</b> Assumes use at not more than 20°C about is implemented.	Not defined ctivities			
is implemented.  Organisational measures	Not defined ctivities ove ambient temperature, unless stated of	differently. Assumes a good basic standard of occupational hygiene		
<b>General measures applicable to all ac</b> Assumes use at not more than 20°C abo is implemented.	Not defined  ctivities  ove ambient temperature, unless stated of  Drain or remove substance from	differently. Assumes a good basic standard of occupational hygiene		
General measures applicable to all ac Assumes use at not more than 20°C abo is implemented. Organisational measures PROC8a (Maintenance)	Not defined  ctivities  ove ambient temperature, unless stated of  Drain or remove substance from at least 90%)	differently. Assumes a good basic standard of occupational hygiene equipment prior to break-in or maintenance. (Inhalation Efficiency o		
General measures applicable to all ac Assumes use at not more than 20°C abo is implemented. Organisational measures	Not defined  ctivities  ove ambient temperature, unless stated of  Drain or remove substance from at least 90%)	differently. Assumes a good basic standard of occupational hygiene		
General measures applicable to all act Assumes use at not more than 20°C about is implemented. Organisational measures PROC8a (Maintenance) PROC15 Technical conditions of use	Not defined  ctivities  ove ambient temperature, unless stated of  Drain or remove substance from at least 90%)  Provide a good standard of contri	differently. Assumes a good basic standard of occupational hygiene equipment prior to break-in or maintenance. (Inhalation Efficiency o		
General measures applicable to all act Assumes use at not more than 20°C abo is implemented. Organisational measures PROC8a (Maintenance)  PROC15  Technical conditions of use PROC3, PROC4	Not defined  ctivities  ove ambient temperature, unless stated of  Drain or remove substance from at least 90%)  Provide a good standard of contr least 70%  Sampling via closed loop system	differently. Assumes a good basic standard of occupational hygiene equipment prior to break-in or maintenance. (Inhalation Efficiency of olled ventilation (10 to 15 air changes per hour). Efficiency of at		
General measures applicable to all ac Assumes use at not more than 20°C about is implemented.  Organisational measures PROC8a (Maintenance)  PROC15  Technical conditions of use PROC3, PROC4 PROC8b (bulk open)	Not defined  ctivities  ove ambient temperature, unless stated of  Drain or remove substance from at least 90%)  Provide a good standard of contreleast 70%  Sampling via closed loop system Ensure material transfers are und	differently. Assumes a good basic standard of occupational hygiene equipment prior to break-in or maintenance. (Inhalation Efficiency of olled ventilation (10 to 15 air changes per hour). Efficiency of at selection containment or extract ventilation. Efficiency of at least 30%		
General measures applicable to all act Assumes use at not more than 20°C abo is implemented. Organisational measures PROC8a (Maintenance)  PROC15  Technical conditions of use PROC3, PROC4	Not defined  ctivities  ove ambient temperature, unless stated of  Drain or remove substance from at least 90%)  Provide a good standard of contreleast 70%  Sampling via closed loop system Ensure material transfers are und	differently. Assumes a good basic standard of occupational hygiene equipment prior to break-in or maintenance. (Inhalation Efficiency of olled ventilation (10 to 15 air changes per hour). Efficiency of at		
General measures applicable to all act Assumes use at not more than 20°C abo is implemented.  Organisational measures PROC8a (Maintenance)  PROC15  Technical conditions of use PROC3, PROC4 PROC8b (bulk open) PROC8a (bulk open), PROC9	Not defined  ctivities  ove ambient temperature, unless stated of contract least 90%)  Provide a good standard of contract least 70%  Sampling via closed loop system Ensure material transfers are und Ensure material transfers are und	differently. Assumes a good basic standard of occupational hygiene equipment prior to break-in or maintenance. (Inhalation Efficiency colled ventilation (10 to 15 air changes per hour). Efficiency of at section of the section of th		
General measures applicable to all act Assumes use at not more than 20°C abo is implemented.  Organisational measures PROC8a (Maintenance)  PROC15  Technical conditions of use PROC3, PROC4 PROC8b (bulk open)	Not defined  ctivities  Ove ambient temperature, unless stated of contract least 90%)  Provide a good standard of contract least 70%  Sampling via closed loop system  Ensure material transfers are und  Ensure material transfers are und  to human health  PROC2, PROC 2 (Storage), PROC3 (Sampling), PROC3 (Sampling), PROC3 (Sampling), PROC8b (bulk closed)	differently. Assumes a good basic standard of occupational hygiene equipment prior to break-in or maintenance. (Inhalation Efficiency colled ventilation (10 to 15 air changes per hour). Efficiency of at section of the section of th		
General measures applicable to all act Assumes use at not more than 20°C abo is implemented.  Organisational measures PROC8a (Maintenance)  PROC15  Technical conditions of use PROC3, PROC4 PROC8b (bulk open) PROC8a (bulk open), PROC9  Risk management measures related to	Not defined  ctivities  ove ambient temperature, unless stated of control of the	differently. Assumes a good basic standard of occupational hygiene equipment prior to break-in or maintenance. (Inhalation Efficiency of colled ventilation (10 to 15 air changes per hour). Efficiency of at section containment or extract ventilation. Efficiency of at least 30% der containment or extract ventilation. Efficiency of at least 90% der containment or extract ventilation. Efficiency of at least 90% der containment or extract ventilation. Efficiency of at least 90% der containment or extract ventilation. Efficiency of at least 90% der containment or extract ventilation between the containment or extract ventilation of possible, where a respirator conforming to EN140 with Type A filter or better.		

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2.2 Control of environmental exposure			
Amounts used			
Fraction of EU tonnage used in region:	1.0		
Regional use tonnage (tons/year):	9.01E+05		
Fraction of Regional tonnage used locally: tons/year	0.02 (Distribution) 1 (Storage)		
Annual site tonnage (tons/year):	18,020 (Distribution) 901,000 (Storage)		
Maximum daily site tonnage (kg/day):	51,486 (Distribution) 2,468,493 (Storage)		
Environment factors not influenced by risk management			
Flow rate of receiving surface water (m³/d):	20,000		
Local freshwater dilution factor:	10		
Local marine water dilution factor:	100		
Operational conditions			
Emission days (days/year):	350 (Continuous release.)		
Release fraction to air from process (initial release prior to RMM):	1.0E-04		
Release fraction to wastewater from process (initial release prior to RMM):	1.0E-05		
Release fraction to soil from process (initial release prior to RMM):	1.0E-05		
Technical onsite conditions and measures to reduce or limit of	discharges, air emissions and releases to soil		
Treat air emission to provide a typical removal efficiency of (%):	0		
Treat onsite wastewater (prior to receiving water discharge) to	97 (Transport)		
provide the required removal efficiency of (%):	99 (Storage)		
If discharging to domestic sewage treatment plant, provide the	60 (Transport)		
required onsite wastewater removal efficiency of (%):	80 (Storage)		
Treat soil emission to provide a typical removal efficiency of (%):	0		
Note: Common practices vary across sites thus conservative proc	ess release estimates used. No wastewater treatment required.		
Organisational measures to prevent/limit release from site			
Prevent discharge of undissolved substance to or recover from on	site wastewater.		
Conditions and measures related to municipal sewage treatm	ent plant		
Size of municipal sewage system/treatment plant (m³/d)	2,000		
Degradation effectiveness (%)	92.3		
Conditions and measures related to external treatment of was	ste for disposal		
External treatment and disposal of waste should comply with appli	icable local and/or national regulations.		
Substance release quantities after risk management measure	es		
Release to waste water from process (mg/l)	Not defined		
Maximum allowable site tonnage (MSafe) (kg/d):	Not defined		

#### 3. Exposure estimation and reference to its source

### 3.1 Human exposure prediction

	In	halation		Dermal	General Comment Regarding All Proc's
Process category [PROC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure(m g/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PROC1	0.04	0.00	0.34	0.00	0.00
PROC2	89	0.84	1.37	0.00	0.84
PROC2 (Storage)	42.4	0.40	1.37	0.00	0.40
PROC3	42	0.40	0.34	0.00	0.40
PROC3 (Sampling)	42.4	0.40	0.34	0.00	0.40
PROC4	42	0.40	6.86	0.00	0.40
PROC8a (Maintenance)	63.6	0.60	13.7	0.00	0.60
PROC8b (bulk closed)	89	0.84	6.86	0.00	0.84

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Γ	PROC8b (bulk open)	63.6	0.60	6.86	0.00	0.60
	PROC8b (Drum)	85	0.80	6.86	0.00	0.80
	PROC15	64	0.60	0.34	0.00	0.34

PROCOD (Dulk open)	03.0	0.60	0.00	0.00	0.00
PROC8b (Drum)	85	0.80	6.86	0.00	0.80
PROC15	64	0.60	0.34	0.00	0.34

# 3.2 Environmental exposure prediction

Exposure assessment (method/calculation model) EUSES v2.1

Transport

environmental exposure	STP	freshwater	marine water	soil	freshwater sediment	marine sediment
RCR	8.32E-04	2.88E-04	9.47E-03	2.83E-04	6.28E-05	1.34E-04
PEC	0.01	1.47E-03	1.61E-04	6.82E-04	1.79E-03	1.95E-04

#### Storage

environmental exposure	STP	freshwater	marine water	soil	freshwater sediment	marine sediment
RCR	8.48E-04	2.94E-03	n.a.	9.54E-03	2.94E-03	n.a.
PEC	0.011	1.50E-03	n.a.	0.023	1.82E-03	n.a.

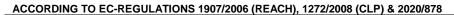
#### **Human exposure prediction**

Route of Exposure	Exposure (µg kg <sup>-1</sup> day <sup>-1</sup> )	RCR
Transport		
Oral	7.86E-03	6.29E-06
Inhalation	2.03E-04	1.13E-05
Storage		
Oral	8.08E-04	6.46E-05
Inhalation	7.84E-04	4.35E-05

4. Evaluation guidance to downstream user					
For scaling see	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.  Available hazard data do not support the need for a DNEL to be established for other health effects.  Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).				
Exposure assessment	Workers	ECETOC TRA v2.0 Worker			
instrument/tool/method	environmental exposure	EUSES v2.1			

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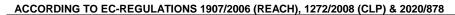
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### **Exposure Scenario 2 – Formulation**

1.0 Contributing Scenarios	
Sector of uses SU	3,
Process category [PROC]	1, 2, 2 (Storage), 3, 3 (Sampling), 3 (Elevated), 8a (Maintenance), 8a (manual), 8b (bulk closed), 8b (Drum), 9, 15
Chemical product category [PC]	not applicable
Article Categories [AC]	not applicable
Environmental release categories [ERC]	2
Specific Environmental Release Categories SPERC	ESVOC3 SpERC

2.0 Operational conditions and risk man	agement measures			
2.1 Control of worker exposure	_			
Product characteristics				
Physical form of product	Liquid with high volatility.			
Concentration of substance in product	Covers concentration	s up to 10	00%	
Human factors not influenced by risk ma	anagement	•		
Potential exposure area	Not defined			
Frequency and duration of use	•			
	PROC2 (Storage), PROC2 (Maintenance)		Covers exposure up to 1 hour	
Exposure duration per day	PROC2, PROC5, PR (manual)	OC8a	Covers exposure up to 4 hours	
	All other PROC's		Covers exposure up to 8 hours	
Other operational conditions affecting v	vorker exposure		•	
Area of use	PROC2		Outdoor	
Area or use	All other PROC's		Indoor	
Characteristics of the surroundings	Not defined			
Assumes use at not more than 20°C above is implemented.  Organisational measures			d differently. Assumes a good basic standard of occupational hygiene	
PROC8a (Maintenance)	Drain or remove subs at least 90%	stance fro	m equipment prior to break-in or maintenance. Inhalation Efficiency of	
PROC15	Provide a good stand least 70%	lard of co	ntrolled ventilation (10 to 15 air changes per hour). Efficiency of at	
Technical conditions of use				
PROC3, PROC3 (Sampling), PROC3 (Elevated), PROC4, PROC5, PROC9	Provide extract ventile	ation to p	oints where emissions occur. Efficiency of at least 90%	
PROC8b (bulk), PROC8b (Drum)	Provide extract ventila	ation to p	oints where emissions occur. Efficiency of at least 97%	
PROC8a (manual)	Provide extract ventile	ation to p	oints where emissions occur. Efficiency of at least 90%	
Risk management measures related to I				
Respiratory protection	PROC2, PROC2 (Sto PROC5, PROC8a (m PROC8a (Maintenan	anual),	If exposure duration technically not possible, Wear a respirator conforming to EN140 with Type A filter or better.	
Hand and/or Skin protection	No special measures	_	ired.	
Eye Protection	No special measures	are requi	ired.	
Other operational conditions affecting v				
None.				
2.2 Control of environmental exposure				
Amounts used				
Fraction of EU tonnage used in region:		901,000		
Fraction of EU tonnage used in region:  Regional use tonnage (tons/year):	9	01,000		

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Annual site tonnage (tons/year):	45.050					
Maximum daily site tonnage (kg/day):	150,167					
Environment factors not influenced by risk management						
	00.000					
Flow rate of receiving surface water (m³/d):	20,000					
Local freshwater dilution factor:	10					
Local marine water dilution factor:	100					
Operational conditions						
Emission days (days/year):	300 (Continuous release.)					
Release fraction to air from process (initial release prior to RMM):	1.0E-03					
Release fraction to wastewater from process (initial release prior to RMM):	3.0E-04					
Release fraction to soil from process (initial release prior to RMM):	1.0E-04					
Technical onsite conditions and measures to reduce or limit of	discharges, air emissions and releases to soil					
Treat air emission to provide a typical removal efficiency of (%):	0					
Treat onsite wastewater (prior to receiving water discharge) to	99					
provide the required removal efficiency of (%):						
If discharging to domestic sewage treatment plant, provide the	80					
required onsite wastewater removal efficiency of (%):						
Treat soil emission to provide a typical removal efficiency of (%):	0					
Note: Common practices vary across sites thus conservative process.	ess release estimates used. No wastewater treatment required.					
Organisational measures to prevent/limit release from site	·					
Prevent discharge of undissolved substance to or recover from on	site wastewater.					
Conditions and measures related to municipal sewage treatment plant						
Not applicable	Not applicable					
Conditions and measures related to external treatment of was	ste for disposal					
Not applicable	, , , , , , , , , , , , , , , , , , ,					
Substance release quantities after risk management measure	s					
Release to waste water from process (mg/l)	Not defined					
Maximum allowable site tonnage (MSafe) (kg/d):	Not defined					

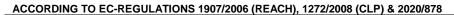
### 3. Exposure estimation and reference to its source

#### 3.1 Human exposure prediction

	li	nhalation		Dermal	General Comment Regarding All Proc's
Process category [PROC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure(m g/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PROC1	0.04	0.00	0.34	0.00	0.00
PROC2	89	0.84	1.37	0.00	0.84
PROC2 (Storage)	42	0.40	1.37	0.00	0.40
PROC3	42	0.40	0.34	0.00	0.40
PROC3 (Sampling)	42	0.40	0.34	0.00	0.40
PROC3 (Elevated)	42	0.40	0.34	0.00	0.40
PROC4	42	0.40	6.86	0.00	0.40
PROC5	64	0.60	13.7	0.00	0.60
PROC8a (Maintenance)	21	0.20	13.7	0.00	0.20
PROC8a (manual)	64	0.60	13.7	0.00	0.60
PROC8b (bulk closed)	19	0.18	6.86	0.00	0.18
PROC8b (Drum)	19	0.20	6.86	0.00	0.20
PROC9	85	0.80	6.86	0.00	0.80
PROC15	64	0.60	0.34	0.00	0.60

3.2 Environmental exposure prediction	
Exposure assessment (method/calculation model)	EUSES v2.1

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environmental exposure	STP	freshwater	marine water	soil	freshwater sediment	marine sediment
RCR	8.8E-04	2.94E-03	9.65E-03	0.019	6.39E-05	1.37E-04
PEC	0.011	1.50E-03	1.63E-04	0.045	1.82E-03	1.99E-04

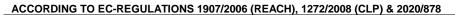
#### **Human exposure prediction**

Route of Exposure	Exposure (µg kg <sup>-1</sup> day <sup>-1</sup> )	RCR
Oral	1.92E-04	1.54E-05
Inhalation	4.04E-04	2.24E-06

4. Evaluation guidance to	downstream user	
For scaling see	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.  Available hazard data do not support the need for a DNEL to be established for other health effects.  Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).	
Exposure assessment	Workers ECETOC TRA v2.0 Worker	
instrument/tool/method	environmental exposure	EUSES v2.1

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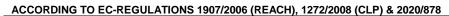
### Exposure Scenario 3 – Use as a fuel (Industrial)

1.0 Contributing Scenarios	
Sector of uses SU	3
Process category [PROC]	1, 2, 2 (Storage), 3, 8a (maintenance), 8a (manual), 8b (bulk), 8b (Drum), 16
Chemical product category [PC]	not applicable
Article Categories [AC]	not applicable
Environmental release categories [ERC]	8b
Specific Environmental Release Categories	ESVOC3 SpERC
SPERC	LOVOCO OPENO

2.0 Operational conditions and risk man	agement measures				
2.1 Control of worker exposure					
Product characteristics					
Physical form of product	Liquid with high vola	tility.			
Concentration of substance in product	Covers concentration	ns up to 1	5%		
Human factors not influenced by risk m					
Potential exposure area	Not defined				
Frequency and duration of use					
	PROC8a (Maintenar	nce),	0		
Exposure duration per day	PROC8a (bulk)		Covers exposure up to 4 hours		
	All other PROC's		Covers exposure up to 8 hours		
Other operational conditions affecting v	vorker exposure				
Area of use	PROC2 (Storage)		Outdoor		
Area or use	All other PROC's		Indoor		
Characteristics of the surroundings	Not defined				
General measures applicable to all activ	vities				
Assumes use at not more than 20°C above is implemented.	e ambient temperature, ur	nless state	d differently. Assumes a good basic standard of occupational hygiene		
Organisational measures					
PROC8a (Maintenance)	Drain or remove sub at least 80%	stance fro	m equipment prior to break-in or maintenance. Inhalation Efficiency of		
Technical conditions of use					
PROC8b (bulk)	Mandatory use of St	age 1 Var	our Recovery. Efficiency of at least 80%		
PROC2, PROC3	Provide extract venti	ilation to p	oints where emissions occur. Efficiency of at least 90%		
PROC8b (Drum)	Use drum pumps. Et	fficiency o	f at least 80%		
Risk management measures related to	human health				
Respiratory protection	PROC8a (bulk), PRO	OC8a	If exposure duration technically not possible, Wear a respirator		
Respiratory protection	(Maintenance)		conforming to EN140 with Type A filter or better.		
Hand and/or Skin protection	No special measures	s are requ	ired.		
Eye Protection	No special measures	s are requ	ired.		
Other operational conditions affecting v	vorker exposure				
None.					
2.2 Control of environmental exposure					
Amounts used					
Fraction of EU tonnage used in region:		1			
Regional use tonnage (tons/year):		901,000			
, ,			0.02		
Annual site tonnage (tons/year):		18,020			
Maximum daily site tonnage (kg/day): 51,					
Environment factors not influenced by					
Flow rate of receiving surface water (m³/d):		20,000			
Local freshwater dilution factor:		10			
Local marine water dilution factor:		100			
Operational conditions					
Emission days (days/year): 350 (Continuous release.)			inuous release.)		

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Release fraction to air from process (initial release prior to RMM):	0.25			
Release fraction to wastewater from process (initial release prior to RMM):	1.0E-04			
Release fraction to soil from process (initial release prior to RMM):	1.0E-03			
Technical onsite conditions and measures to reduce or limit of	discharges, air emissions and releases to soil			
Treat air emission to provide a typical removal efficiency of (%):	0			
Treat onsite wastewater (prior to receiving water discharge) to	95			
provide the required removal efficiency of (%):				
If discharging to domestic sewage treatment plant, provide the	0			
required onsite wastewater removal efficiency of (%):				
Treat soil emission to provide a typical removal efficiency of (%):	0			
Note: Common practices vary across sites thus conservative proc	ess release estimates used. No wastewater treatment required.			
Organisational measures to prevent/limit release from site				
Prevent discharge of undissolved substance to or recover from on	site wastewater.			
Conditions and measures related to municipal sewage treatment	ent plant			
Not applicable				
Conditions and measures related to external treatment of waste for disposal				
Not applicable				
Substance release quantities after risk management measures				
Release to waste water from process (mg/l)	Not defined			
Maximum allowable site tonnage (MSafe) (kg/d):	Not defined			

#### 3. Exposure estimation and reference to its source

### 3.1 Human exposure prediction

	ı	nhalation		Dermal	General Comment Regarding All Proc's	
Process category [PROC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure(m g/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)	
PROC1	0.03	0.00	0.00	0.00	0.00	
PROC2	13	0.12	0.82	0.00	0.12	
PROC2 (Storage)	21ppm	0.84	0.82	0.00	0.84	
PROC3	6ppm	0.24	0.20	0.00	0.24	
PROC8a (Maintenance)	76	0.72	8.23	0.00	0.72	
PROC8b (bulk)	46	0.43	4.12	0.00	0.43	
PROC8b (Drum)	76	0.72	4.12	0.00	0.72	
PROC16	64	0.60	0.20	0.00	0.60	

### 3.2 Environmental exposure prediction

Exposure assessment (method/calculation model) EUSES v2.1

environmental exposure	STP	freshwater	marine water	soil	freshwater sediment	marine sediment
RCR	8.32E-04	2.88E-04	9.47E-03	2.83E-04	6.28E-05	1.34E-04
PEC	0.01	1.47E-04	1.61E-04	6.82E-04	1.79E-03	1.95E-04

#### **Human exposure prediction**

Route of Exposure	Exposure (µg kg <sup>-1</sup> day <sup>-1</sup> )	RCR
Oral	1.92E-04	1.54E-05
Inhalation	4.04E-04	2.24E-06

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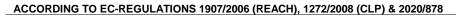


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4. Evaluation guidance to downstream user				
For scaling see	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.  Available hazard data do not support the need for a DNEL to be established for other health effects.  Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).			
Exposure assessment	Workers	ECETOC TRA v2.0 Worker		
instrument/tool/method	environmental exposure	EUSES v2.1		

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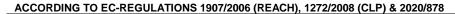
### Exposure Scenario 4 – Use as a fuel (professional)

1.0 Contributing Scenarios	
Sector of uses SU	22
Process category [PROC]	1 (Storage), 2, 3, 8a (maintenance), 8b (bulk), 8b (Drum), 8b (refueling), 9, 16
Chemical product category [PC]	not applicable
Article Categories [AC]	not applicable
Environmental release categories [ERC]	8b, 8e
Specific Environmental Release Categories SPERC	ESVOC3 SpERC

2.0 Operational conditions and risk man	agement measures			
2.1 Control of worker exposure	_	_		
Product characteristics				
Physical form of product	Liquid with high vo	olatility.		
Concentration of substance in product	Covers concentrate		5%	
Human factors not influenced by risk ma				
Potential exposure area	Not defined			
Frequency and duration of use				
	PROC8b (Refuelli	na)	Covers exposure up to 1 hours	
	PROC2, PROC8a		' '	
Exposure duration per day	(Maintenance), PF		), Covers exposure up to 4 hours	
	All other contributi	ing scenarios	Covers exposure up to 8 hours	
Other operational conditions affecting w			· · ·	
	PROC8b (Drum),	PROC16	Outdoor	
Area of use	All other scenarios		Indoor	
Characteristics of the surroundings	Not defined		l	
is implemented.		unless state	d differently. Assumes a good basic standard of occupational hygiene	
Organisational measures				
PROC8a (Maintenance)	at least 90%	Drain or remove substance from equipment prior to break-in or maintenance. Inhalation Efficiency of at least 90%		
PROC3, PROC8b (Refueling)	least 70%		ntrolled ventilation (10 to 15 air changes per hour). Efficiency of at	
PROC16			ventilated area. Provide a good standard of controlled ventilation (10 ficiency of at least 70%	
Technical conditions of use				
PROC8b (bulk), PROC8b (Drum)		Stage 1 Vapour Recovery. Efficiency of at least 80%		
PROC9	Use drum pumps.	Efficiency of at least 80%		
Risk management measures related to I	numan health			
Respiratory protection	PROC2, PROC8a PROC8a (Mainter PROC8b (Refuelin PROC9	nance),	If exposure duration technically not possible, Wear a respirator conforming to EN140 with Type A filter or better.	
Hand and/or Skin protection	No special measu	res are requi	ired.	
Eye Protection	No special measu	res are requ	ired.	
Other operational conditions affecting w		·		
None.	-			
2.2 Control of environmental exposure				
Amounts used				
Fraction of EU tonnage used in region:		Not defined		
Regional use tonnage (tons/year):		Not defined		
Fraction of Regional tonnage used locally: tons/year		Not define		
Annual site tonnage (tons/year):		Not applicable - Dispersive use		
Maximum daily site tonnage (kg/day):		4.94		

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Environment factors not influenced by risk management						
Flow rate of receiving surface water (m³/d):	20,000					
Local freshwater dilution factor:	10					
Local marine water dilution factor:	100					
Operational conditions						
Emission days (days/year):	365 (Dispersive use)					
Release fraction to air from process (initial release prior to RMM):	1.0E-04					
Release fraction to wastewater from process (initial release prior to RMM):	1.0E-05					
Release fraction to soil from process (initial release prior to RMM):	1.0E-05					
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil						
Treat air emission to provide a typical removal efficiency of (%):	0					
Treat onsite wastewater (prior to receiving water discharge) to	95					
provide the required removal efficiency of (%):						
If discharging to domestic sewage treatment plant, provide the	0					
required onsite wastewater removal efficiency of (%):						
Treat air emission to provide a typical removal efficiency of (%):	0					
Note: Common practices vary across sites thus conservative proce	ess release estimates used. No wastewater treatment required.					
Organisational measures to prevent/limit release from site						
Prevent discharge of undissolved substance to or recover from on	site wastewater.					
Conditions and measures related to municipal sewage treatm	ent plant					
Not applicable						
Conditions and measures related to external treatment of was	ste for disposal					
Not applicable						
Substance release quantities after risk management measure						
Release to waste water from process (mg/l)	Not defined					
Maximum allowable site tonnage (MSafe) (kg/d):	Not defined					

# 3. Exposure estimation and reference to its source

#### 3.1 Human exposure prediction

	Inhalation			Dermal	General Comment Regarding All Proc's
Process category [PROC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure(m Risk characterisation g/kg ratio (RCR) bw/day)		Risk characterisation ratio (RCR)
PROC1 (Storage)	0.25	0.00	0.2	0.00	0.00
PROC2	76	0.72	0.20	0.00	0.72
PROC3	76	0.72	8.2	0.00	0.72
PROC8a (Maintenance)	76	0.72	8.2	0.00	0.72
PROC8b (bulk)	76	0.72	4.1	0.00	0.72
PROC8b (Drum)	89	0.84	2.1	0.00	0.84
PROC8b (Refueling)	38	0.36	2.1	0.00	0.36
PROC9	76	0.72	4.1	0.00	0.72
PROC16	89	0.84	0.20	0.00	0.84

#### 3.2 Environmental exposure prediction

Exposure assessment (method/calculation model) EUSES v2.1

environmental exposure	STP	freshwater	marine water	soil	freshwater sediment	marine sediment
RCR	4.16E-07	8.51E-04	3.35E-03	2.22E-05	4.78E-05	4.78E-05
PEC	5.20E-06	4.34E-04	5.70E-05	5.35E-05	5.27E-04	6.93E-05

**Human exposure prediction** 

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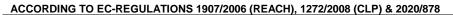
ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

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Route of Exposure	Exposure (µg kg <sup>-1</sup> day <sup>-1</sup> )	RCR
Oral	2.98E-05	2.38E-06
Inhalation	1.41E-04	7.84E-06

4. Evaluation guidance to downstream user								
For scaling see  Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.  Available hazard data do not support the need for a DNEL to be established for other health effects.  Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).								
Exposure assessment	xposure assessment Workers ECETOC TRA v2.0 Worker							
instrument/tool/method	environmental exposure	EUSES v2.1						

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**ETBE V4020** 

### Exposure Scenario 5 – Use as a fuel (Consumer)

1.0 Contributing Scenarios	
Sector of uses SU	21
Process category [PROC]	not applicable
Chemical product category [PC]	PC13 (Refueling Car)
Article Categories [AC]	not applicable
Environmental release categories [ERC]	8d
Specific Environmental Release Categories SPERC	ESVOC30 SpERC

2.0 Operational conditions and risk manage	ement measures					
2.1 Control of worker exposure						
Product characteristics						
Physical form of product	Liquid with high volatility.					
Concentration of substance in product	Covers concentrat					
Human factors not influenced by risk mana	agement	•				
Potential exposure area	Not defined					
Operational conditions						
Area of use	Not defined					
Characteristics of the surroundings	Not defined					
Risk management measures						
Respiratory protection	No specific measu	res identified.				
Hand/Skin protection	No specific measu	res identified.				
Eye Protection	No specific measu					
2.2 Control of environmental exposure						
Amounts used						
Fraction of EU tonnage used in region:		Not defined				
Regional use tonnage (tons/year):		Not defined				
Fraction of Regional tonnage used locally: ton	s/year	Not defined				
Annual site tonnage (tons/year):		Not defined				
Maximum daily site tonnage (kg/day):		4.94				
Environment factors not influenced by risk management						
Flow rate of receiving surface water (m³/d):		20,000				
Local freshwater dilution factor:		10				
Local marine water dilution factor:		100				
Operational conditions						
Emission days (days/year):		365 (Dispersive use)				
Release fraction to air from process (initial release prior to RMM):		1.0E-02				
Release fraction to wastewater from process (initial release prior to RMM):		1.0E-05				
Release fraction to soil from process (initial release prior to RMM):		1.0E-05				
Organisational measures to prevent/limit release from site						
No specific measures identified.						
Technical onsite conditions and measures	to reduce or limit of	discharges, air emissions and releases to soil				
Treat air emission to provide the required rem (%):	oval efficiency of	0				
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):		95				
Estimated substance removal from wastewater via on-site sewage treatment (%):		0				
Treat soil emission to provide a typical remova	al efficiency of (%):	0				
Note: No specific measures identified.						
Conditions and measures related to munic	ipal sewage treatm	nent plant				
Size of municipal sewage system/treatment pl		2,000				
Degradation effectiveness (%)	\/	95				
	Conditions and measures related to external treatment of waste for disposal					
		ols. External treatment and disposal of waste should comply with applicable local				
and/or national regulations.						
Substance release quantities after risk mai	nagement measure	os estados esta				

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#### ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

Release to waste water from process (mg/l)	Not defined
Maximum allowable site tonnage (MSafe) (kg/d):	Not defined

record to make the make the process (mg/l)	
Maximum allowable site tonnage (MSafe) (kg/d):	Not defined

# 3. Exposure estimation and reference to its source

#### 3.1 Human exposure prediction

Exposure assessment (method/calculation model) ECETOC TRA

Note: Oral exposure is not expected to occur.

	Inhalation		Dermal		Overall
Process category [PROC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure(m g/kg bw/day)	Risk characterisation ratio (RCR)	inhalation exposure (mg/m³)
PC13 (Refueling Car)	0.026	4.13E-04	0.0011	2.81E-06	4.16E-04

#### 3.2 Environmental exposure prediction

Exposure assessment (method/calculation model) EUSES v2.1

environmental exposure	STP	freshwater	marine water	soil	freshwater sediment	marine sediment
RCR	4.16E-07	8.51E-04	3.35E-03	2.22E-05	4.78E-05	4.78E-05
PEC	5.2E-06	4.34E-04	5.70E-05	5.35E-05	5.27E-04	6.93E-05

Indirect exposure to humans via the environment:

Exposure route	Exposure estimation (µg/kg/day)	Risk characterisation ratio (RCR)
Oral	2.98E-05	2.38E-06
Inhalation	1.41E-04	7.84E-06

4. Evaluation guidance to downstream user			
For scaling see	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.  Available hazard data do not support the need for a DNEL to be established for other health effects.  Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Exposure assessment	Workers	Measured exposure level (EU RAR of MTBE)	
instrument/tool/method	environmental exposure	EUSES v2.1	

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