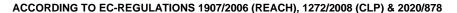
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### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name ETHANOL

Product description V4004- ANHYDROUS ETHANOL-ETHANOL

Trade Name ANHYDROUS ETHANOL Product code V4004, BIOETHAN

CAS No. 64-17-5 EC No. 200-578-6

REACH Registration No. 01-2119457610-43-xxxx

1.2 Relevant identified uses of the substance or mixture

and uses advised against

NoExposure ScenarioPage:1Industrial Distribution of Ethanol102Industrial Formulation and (re)packing of ethanol and other fuels (including mixtures)13

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 Eye Irrit. 2; H319

Label elementsAccording to Regulation (EC) No. 1272/2008 (CLP)Product descriptionV4004- ANHYDROUS ETHANOL-ETHANOL

Hazard Pictogram(s)

2.2





Signal Word(s) DANGER

Hazard Statement(s)

H225: Highly flammable liquid and vapour.

H319: Causes serious eye irritation.

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

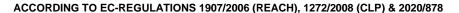
ignition sources. No smoking.

P280: Wear protective gloves/protective clothing/eye protection/face protection. P303+P361+P353: IF ON SKIN or hair: Take off immediately all contaminated

clothing. Rinse skin with water.

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P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P403+P233: Store in a well-ventilated place. Keep container tightly closed.

2.3 Other hazards May form explosive mixture with air. The vapour is heavier than air; beware of pits and confined spaces.

#### **SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

#### 3.1 **Substances**

SUBSTANCE	CAS No.	EC No.	%W/W
Ethanol	64-17-5	200-578-6	100

### **SECTION 4: FIRST AID MEASURES**



4.3

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

> Indication of any immediate medical attention and special treatment needed

If it is suspected that fumes are still present, the responder should wear an appropriate mask or self-contained breathing apparatus.

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): Wash affected skin with plenty of water. Wash contaminated clothing before reuse. 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 into the lungs. Obtain medical attention if symptoms appear or if large quantities have been ingested.

Ingestion may cause irritation of the gastrointestinal tract. Causes eye irritation.

Unlikely to be required but if necessary treat symptomatically.

## SECTION 5: FIREFIGHTING MEASURES

#### 5.1 Extinguishing media

Suitable extinguishing media

Unsuitable extinguishing media

5.2 Special hazards arising from the substance or mixture

5.3 Advice for firefighters Extinguish with sand or dry chemical. Foam, Carbon dioxide, Water fog or dry powder.

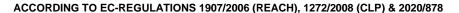
Do not use water jet. Direct water jet may spread the fire.

Flammable liquid and vapour. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. Prevent liquid entering sewers, basements and any watercourses. Decomposes in a fire giving off toxic fumes: Oxides of carbon.

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.

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#### 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.

Methods and material for containment and cleaning 6.3

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.

See Section: 8.13

6.4 Reference to other sections

#### **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. 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 inhalation and contact with eyes or skin. Use personal protective equipment as required. See Section: 8. Keep good industrial hygiene. Wash hands thoroughly after handling. Contaminated clothing

should be thoroughly cleaned.

7.2 Conditions for safe storage, including any

incompatibilities

Storage temperature

Storage measures

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.

Stable at ambient temperatures. Keep only in the original container.

Suitable material: Mild steel, Carbon Steel, Stainless steel, Titanium, Bronze.

Rubber, PVC, Zinc, Brass, Aluminium.

Incompatible materials Specific end use(s) See Section: 1.2 and/or Exposure Scenario

### SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

7.3

811 Occupational exposure limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Ethanol	64-17-5	1000	1920	-	-	WEL

Source: WEL: Workplace Exposure Limit (UK HSE EH40)

SUBSTANCE	CAS No.	Occupational Exposure Limit Value (8-hour reference period)		Occupational Exposure Limit Value (15-minute reference period)		Notes
		ppm mg/m³		ppm	mg/m³	
Ethanol	64-17-5	-	-	1000	-	-

Source: 2021 Code of Practice for Safety, Health and Welfare at Work (Chemical Agents) Regulation (2001 – 2021) and the Safety, Health and Welfare at Work (Carcinogens) Regulations (2001 – 2019); Health and Safety Authority

8.1.2 **Biological limit value** Not established

**PNECs and DNELs** 8.1.3

DNEL MTBE	Oral (mg/kg bw/day)	Inhalation (mg/m³)	Dermal (mg/kg bw/day)	
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#### ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

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Industry- Long Term - Systemic effects	-	950	343
Industry- Short term - Local effects	-	1900	-
Consumer - Long Term - Systemic effects	84	114	206
Consumer - Long Term - Local effects	-	950	-

PNEC	MTBE
Aquatic Compartment	PNEC aquatic, freshwater 0.96 mg/L
	PNEC aquatic, marine water 0.79 mg/L
	PNEC aquatic, intermittent release 2.75 mg/L
	PNEC STP 580 mg/L
	PNEC freshwater sediment 3.6 mg/kg sediment dw
	PNEC sediment, marine water 2.9 mg/kg sediment dw
Terrestrial Compartment	PNEC soil 0.63 mg/kg soil dw
Hazard for predators	PNEC Oral 0.72 g/kg

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.

8.2.2 Individual protection measures, such as personal protective equipment

Good hygiene practices and housekeeping measures.

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: Wear work clothes with long sleeves.

Respiratory protection



In case of insufficient ventilation, wear suitable respiratory equipment. In the unlikely event of formation of particularly high levels of vapour a self contained breathing apparatus may be appropriate.

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 Colourless to yellowish liquid.

Odour Alcohol-like Melting point/freezing point - 114 °C 78 °C

Boiling point or initial boiling point and boiling range

Flammability

Lower and upper explosion limit

363 - 425 °C Auto-ignition temperature Not established Decomposition temperature рΗ Not established

12-13 °C Flash point

Not established

Highly flammable liquid and vapour.

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Kinematic viscosity 1.17 mPa•s at 40 °C

Solubility 789,000 mg/L at 20 °C - Completely miscible with water.

Partition coefficient: n-octanol/water (log value) - 0.35 log P at 20 °C Vapour pressure 5.9 kPa at 20°C

Density and/or relative density 0.79 g/cm3 at 20 °C Relative vapour density 1.59

Particle characteristics Not established

9.2 Other information Vapour may create explosive atmosphere.

Upper/lower flammability or explosive limits Flammable Limits (Upper) (%v/v): 19 Flammable Limits (Lower) (%v/v): 3.3

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

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

10.2 Chemical stability Stable under normal conditions.

10.3 Possibility of hazardous reactions None known

10.4 Conditions to avoid Elevated temperature. Keep away from heat, hot surfaces, sparks, open flames

and other ignition sources. No smoking.

10.5 Incompatible materials Acids. Keep away from oxidising agents.

10.6 Hazardous decomposition products Oxides of carbon

#### SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on hazard classes as defined in

> Regulation (EC) No 1272/2008 Based upon the available data, the classification criteria are not met. Acute toxicity - Ingestion

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

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

LC50 > 50 mg/l (rat) (OECD 403)

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

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

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

> Mean erythema score: 0 (rabbit) (OECD 404) Mean edema score: 0 (rabbit) (OECD 404)

Serious eye damage/irritation Eye Irrit. 2; Causes eye irritation. Positive (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: No evidence of mutagenic effects. Bacteria (OECD 471) In vivo: No evidence of mutagenic effects. (Mouse) (OECD 478)

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

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

Oral: NOAEL =1730 mg/kg bw/day (rat) (OECD 408)

Inhalation: No data available Skin contact: No data available

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

11.2 Information on other hazards

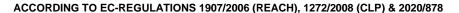
11.2.1 Endocrine disrupting properties This product does not contain a substance that has endocrine disrupting

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.
		LC50 > 100 MG/L (Daphnia magna) (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 has high mobility in soil. Completely miscible with 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\*, 18 01 06\*, 18 02 05\*.

Waste classification according to Directive 2008/98/EC (Waste Framework Directive)

HP3, HP5

## **SECTION 14: TRANSPORT INFORMATION**

14.1	UN number or ID number	ADR/RID UN 1170	IMDG/ADN UN 1170
14.2	UN proper shipping name	ETHANOL (ETHYL ALCOHOL)	ETHANOL (ETHYL ALCOHOL)
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	Special Provisions: 144, 601 HIN: 30 Tunnel Code: 3 (D/E) Limited Quantity: 1L	EmS: F-E, S-D Limited Quantity: 1L

### **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: 50000 tonnes Lower Tier: 5000 tonnes

15.1.2 National regulations

Germany

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



# ETHANOL V4004

#### 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).

Harmonised Classification(s) for Ethanol (CAS No. 64-17-5).

Existing ECHA registration(s) for Ethanol (CAS No. 64-17-5) 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 ADN ADN: European Agreement on the International Transport of Dangerous Goods by Inland Waterways

CAS Chemical Abstracts Service

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

**DNEL** Derived no effect level EC **European Community ECHA European Chemicals Agency** 

EU **European Union** 

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

LTEL Long term exposure limit

NOAEL No Observed Adverse Effect Level

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 RID: Regulations concerning the international railway transport of dangerous goods

STEL Short term exposure limit

UN **United Nations** 

vPvB vPvB: very Persistent and very Bioaccumulative

#### Hazard classification / Classification code:

Flam. Liq. 2; Flammable liquid, Category 2 Eye Irrit. 2; Eye Irritation, Category 2

#### Hazard Statement(s)

H225: Highly flammable liquid and vapour. H319: Causes serious eye irritation.

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 -

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



**Ethanol** 

CAS No. 64-17-5 EC No. 200-578-6

### **Summary of Parameters**

Physical Parameters					
Vapour pressure (hP	Vapour pressure (hPa)			5726	
Partition Coefficient (log K <sub>ow</sub> )			-0.35 at 20 °C		
Aqueous solubility (n	Aqueous solubility (mg/l)			789,000 mg/L at 20 °C	
Molecular weight				46.07	
Biodegradability				Readily biodegradable.	
Human Health (DNE	EL)				
	Ch a st ta sea	Inhalation (mg/m³)		None	
Marka na	Short term	Dermal (mg/kg bw/day)		None	
Workers	L T	Inhalation (mg/m³)		950	
	Long Term  Dermal (mg/kg bw/day)		343		
		Inhalation (mg/m³)		114	
Consumer		Dermal (mg/kg bw/day)		206	
		Oral (mg/kg bw/day)		87	
Environmental Para	Environmental Parameters (PNECs)				
		0.96			
marine water (mg/l) 0.79 freshwater sediment (mg/kg dry weight) 3.6		0.79			
				pplicable	
		0.63	ρριισασίο		
STP (mg/l)			580		
Secondary Poisoning	3		0.38 (	.38 g/kg food	

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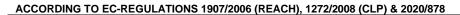
#### **Contents**

Number	Title	Page:
Exposure scenario 1	Industrial Distribution of Ethanol	10
Exposure scenario 2	Industrial Formulation and (re)packing of ethanol and other fuels (including mixtures)	13

## **Contributing Scenarios**

PROC Codes
PROC1 Use in closed process, no likelihood of exposure
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC3 Use in closed batch process (synthesis or formulation)
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5 Mixing or blending in batch processes for formulation of 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
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15 Use as laboratory reagent

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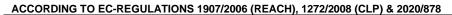
## Exposure Scenario 1 – Industrial Distribution of Ethanol

1.0 Contributing Scenarios	
Sector of uses SU	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
Process category [PROC]	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure PROC3 Use in closed batch process (synthesis or formulation) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 Mixing or blending in batch processes for formulation of 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 PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15 Use as laboratory reagent
Chemical product category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental release categories [ERC]	ERC2 Formulation of preparations ESVOC SpERC 1.1b.v1 (modified)
Specific Environmental Release Categories SPERC	Not applicable

2.0 Operational conditions and risk manage	ement measures			
2.1 Control of worker exposure				
Product characteristics				
Physical form of product	Liquid (Vapour pressure 0.5-10	0kPa)		
Concentration of substance in product	Covers concentrations up to 1	00%		
Human factors not influenced by risk mana	ngement			
None				
Frequency and duration of use				
Exposure duration per day	Covers daily exposures up to 8	8 hours (unless stated differently). Continuous process.		
Exposure duration per year	300 days per year			
Other operational conditions affecting work	ker exposure			
Area of use	All PROC's	Indoor		
Characteristics of the surroundings	Not defined			
General measures applicable to all activities				
	al hygiene is implemented. Assi	umes activities are at ambient temperature (unless stated differently).		
Technical conditions of use				
All PROC's	Indoor use - Handle substance	e within a closed system. Keep container tightly closed.		
Organisational measures				
All PROC's	Avoid splashing.			
Contributing Scenarios				
All PROC's: General measures (eye		void direct eye contact with product, also via contamination on hands.		
irritants)	Avoid splashing. Skin protection			
PROC1 Use in closed process, no likelihood	Continuous process. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above			
of exposure	•	stated differently. Concentration: 25-100%		
	Risk Management Measures:			
	Local Exhaust Ventilation: Nor			
	General ventilation: Not define			
PROC2 Use in closed, continuous process	Continuous release. Emission days (days/year): 300. Indoor use. Duration: > 4 hours. Assumes use			
with occasional controlled exposure	at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100%			
	Risk Management Measures:			
	Local Exhaust Ventilation: Nor			
	General ventilation: Not define	· <del>-</del>		
PROC3 Use in closed batch process		s. Assumes use at not more than 20°C above ambient temperature,		
(synthesis or formulation)	unless stated differently. Conc	entration: 25-100%		

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**ETHANOL V4004** 

	Diek Managamant	Magazirasi Nana	
	Risk Management Local Exhaust Ver		
	General ventilation		
PROC4 Use in batch and other process		on: > 4 hours. Assumes use at not more than 20°C above ambient temperature,	
(synthesis) where opportunity for exposure		erently. Concentration: 25-100%	
arises	Risk Management Measures: None		
anses	Local Exhaust Ver		
	General ventilation		
PROC5 Mixing or blending in batch		on: > 4 hours. Assumes use at not more than 20°C above ambient temperature,	
processes for formulation of preparations		prently. Concentration: 25-100%	
and articles (multistage and/or significant	Risk Management	•	
contact)	Local Exhaust Ver		
· · · · · · · · · · · · · · · · · · ·	General ventilation		
PROC8a Transfer of substance or		on: > 4 hours. Assumes use at not more than 20°C above ambient temperature,	
preparation (charging/discharging) from/to		rently. Concentration: 25-100%	
vessels/large containers at non-dedicated	Risk Management	•	
facilities. Equipment cleaning and	Local Exhaust Ver		
maintenance.	General ventilation	n: Not defined	
PROC8b Transfer of substance or	Indoor use. Durati	on: > 4 hours. Assumes use at not more than 20°C above ambient temperature,	
preparation (charging/discharging) from/to		rently. Concentration: 25-100%	
vessels/large containers at dedicated	Risk Management	Measures: None	
facilities	Local Exhaust Ver	ntilation: None	
	General ventilation		
PROC9 Transfer of substance or		on: > 4 hours. Assumes use at not more than 20°C above ambient temperature,	
preparation into small containers (dedicated	unless stated diffe	rently. Concentration: 25-100%	
filling line, including weighing)	Risk Management		
	Local Exhaust Ver		
	General ventilation		
PROC15 Use as laboratory reagent		on: > 4 hours. Assumes use at not more than 20°C above ambient temperature,	
		erently. Concentration: 25-100%	
	Risk Management Measures: None		
	Local Exhaust Ventilation: None General ventilation: Not defined		
2.2 Central of anying mental synapsing	General ventilation	n: Not defined	
2.2 Control of environmental exposure  Amounts used			
Total supply chain		400000 tpa	
Fraction of EU tonnage used in region:		0.1	
Fraction of Regional tonnage used locally:		0.5	
Environment factors not influenced by risk	r managomont	0.5	
Flow rate of receiving surface water (m³/d):	management	19 000	
Local freshwater dilution factor:		18,000	
Local marine water dilution factor:			
Operational conditions		100	
Emission days (days/year):		300	
Release fraction to air from process (initial rele	agea prior to		
RMM):	ease prior to	0.0001	
Release fraction to wastewater from process (to RMM):	initial release prior	0.00001	
Release fraction to soil from process (initial re RMM):	·	0	
Technical onsite conditions and measures	to reduce or limit	discharges, air emissions and releases to soil	
Treat air emission to provide a typical remova		0	
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):		≥ 87 If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Treat soil emission to provide a typical remova	al efficiency of (%):	0	
Organisational measures to prevent/limit re		1	
Bund storage facilities to prevent soil and water	er pollution in the ev	ent of spillage. Prevent environmental discharge consistent with regulatory e safeguards are in place to minimize the impact of episodic releases.	
Conditions and measures related to munic	inal sawana traatm	ant plant	

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Size of municipal sewage system/treatment plant (m³/d)	2000			
Degradation effectiveness (%)	≥ 87			
Conditions and measures related to external treatment of was	ste for disposal			
Estimated amount entering waste treatment no greater than (%): 2	2. Suitable waste treatment: Incineration, Removal efficiency (total): 99.98%.			
Cement fuels, Removal efficiency (total): 99.98%.				
To be disposed of as hazardous waste. Dispose of waste product or used containers according to local regulations. External treatment and disposal				
of waste should comply with applicable local and/or national regulations.				
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

Exposure assessment (method/calculation model) ECETOC TRA V3.0

	Inhal	ation	Der	Overall	
Process category [PROC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure(mg/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PROC1	0.019	<0.001	0.03	<0.001	<0.001
PROC2	9.6	0.01	1.4	0.004	0.0141
PROC3	19	0.02	0.69	0.002	0.0222
PROC4	38	0.04	6.9	0.02	0.0603
PROC5	96	0.101	14	0.04	0.141
PROC8a	96	0.101	14	0.04	0.141
PROC8b	48	0.05	14	0.04	0.0904
PROC9	96	0.101	6.9	0.02	0.121
PROC15	19	0.02	0.34	<0.001	0.0212

Note: Available hazard data do not enable the derivation of a DNEL for eye irritant effects. Msafe: 66700 te/day.

### 3.2 Environmental exposure prediction

Exposure assessment (method/calculation model)

ECETOC TRA V3.0

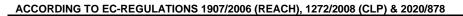
ESVOC SpERC 1.1b.v1 (modified)

environmental exposure	STP	freshwater	marine water	soil	freshwater sediment	marine sediment
Predicted Environmental Exposure	0.421 mg/l	<u>&lt;</u> 0.00654mg/l	≤ 0.000789 mg/l	≤ 0.00189 mg/kg dw	0.0251 mg/kg dw	0.00303 mg/kg dw
Risk characterisation ratio (RCR)	7.26E-05	≤ 6.81E-03	≤ 9.99E-04	≤ 1.11E-02	6.82E-03	1.00E-03

Indirect exposure to humans via the environment: Negligible

4. Evaluation guidance to downstream user						
For scaling see	algorithm below to estimate the confidence of PECcorrected = PECcalculated * fraction) * (local STP efficiency from the standard of the standa	,				
Exposure assessment	Workers	ECETOC TRA V3.0				
instrument/tool/method	environmental exposure	environmental exposure ECETOC TRA V3.0				

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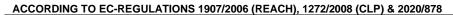
## Exposure Scenario 2 – Industrial Formulation and (re)packing of ethanol and other fuels (including mixtures)

1.0 Contributing Scenarios	
Sector of uses SU	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
Process category [PROC]	PROC1 Use in closed process, no likelihood of exposure PROC2 Use in closed, continuous process with occasional controlled exposure PROC3 Use in closed batch process (synthesis or formulation) PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises PROC5 Mixing or blending in batch processes for formulation of 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 PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC15 Use as laboratory reagent
Chemical product category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental release categories [ERC]	ERC2 Formulation of preparations ESVOC SpERC 2.2.v1 (modified).
Specific Environmental Release Categories SPERC	Not applicable

2.1 Control of worker exposure		
Product characteristics		
Physical form of product	Liquid (Vapour pressu	ure 0.5-10kPa)
Concentration of substance in product	Covers concentration	s up to 100%
Human factors not influenced by risk mana	ngement	
None		
Frequency and duration of use		
Exposure duration per day	Covers daily exposur	es up to 8 hours (unless stated differently). Continuous process.
Exposure duration per year	300 days per year	
Other operational conditions affecting wor	ker exposure	
Area of use	All PROC's	Indoor
Characteristics of the surroundings	Not defined	•
General measures applicable to all activities		
Assumes a good basic standard of occupation	nal hygiene is implemer	ited. Assumes activities are at ambient temperature (unless stated differently).
Technical conditions of use		
All PROC's	Indoor use - Handle s	substance within a closed system. Keep container tightly closed.
Organisational measures		
All PROC's	Avoid splashing.	
Contributing Scenarios		
All PROC's: General measures (eye	Use suitable eye prot	ection. Avoid direct eye contact with product, also via contamination on hands.
irritants)	Avoid splashing. Skin	
PROC1 Use in closed process, no likelihood		Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above
of exposure		unless stated differently. Concentration: 25-100%
	Risk Management Me	easures: None
	Local Exhaust Ventila	ation: None
	General ventilation: N	lot defined
PROC2 Use in closed, continuous process	Continuous release. I	Emission days (days/year): 300. Indoor use. Duration: > 4 hours. Assumes use
with occasional controlled exposure	at not more than 20°0	C above ambient temperature, unless stated differently. Concentration: 25-100%
	Risk Management Me	easures: None
	Local Exhaust Ventila	ation: None
	General ventilation: N	lot defined
PROC3 Use in closed batch process	Continuous process.	Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above
(synthesis or formulation)		unless stated differently. Concentration: 25-100%

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	Risk Management Local Exhaust Ver		
	General ventilation		
PROC4 Use in batch and other process		ss. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above	
(synthesis) where opportunity for exposure		ure, unless stated differently. Concentration: 25-100%	
arises	Risk Management	· · · · · · · · · · · · · · · · · · ·	
anses	Local Exhaust Ver		
	General ventilation		
PROC5 Mixing or blending in batch		ss. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above	
processes for formulation of preparations	ambient temperature, unless stated differently. Concentration: 25-100%		
and articles (multistage and/or significant	Risk Management Measures: None		
contact)	Local Exhaust Ventilation: None		
oo.nao.,	General ventilation		
PROC8a Transfer of substance or		ss. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above	
preparation (charging/discharging) from/to		ure, unless stated differently. Concentration: 25-100%	
vessels/large containers at non-dedicated	Risk Management		
facilities	Local Exhaust Ver		
	General ventilation	n: Not defined	
PROC8b Transfer of substance or	Continuous proces	ss. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above	
preparation (charging/discharging) from/to		ure, unless stated differently. Concentration: 25-100%	
vessels/large containers at dedicated	Risk Management	t Measures: None	
facilities	Local Exhaust Ver	ntilation: None	
	General ventilation	n: Not defined	
PROC9 Transfer of substance or	Continuous proces	ss. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above	
preparation into small containers (dedicated	· ·	ure, unless stated differently. Concentration: 25-100%	
filling line, including weighing)	Risk Management		
	Local Exhaust Ver		
	General ventilation		
PROC15 Use as laboratory reagent		ss. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above	
		ure, unless stated differently. Concentration: 25-100%	
	Risk Management		
	Local Exhaust Ventilation: None		
	General ventilation	n: Not defined	
2.2 Control of environmental exposure  Amounts used			
Total supply chain		400000 tpa	
Fraction of EU tonnage used in region:		'	
Fraction of Regional tonnage used locally:		1	
Environment factors not influenced by risk	r managamant	0.075	
Ellalioullieur laciorz noi immeniceu uz uz			
-	managomon	49,000	
Flow rate of receiving surface water (m³/d):	managomoni	18,000	
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor:	. management	10	
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor: Local marine water dilution factor:	· management		
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor: Local marine water dilution factor:  Operational conditions	· · · · · · · · · · · · · · · · · · ·	10 100	
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor: Local marine water dilution factor:  Operational conditions Emission days (days/year):		10	
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor: Local marine water dilution factor:  Operational conditions  Emission days (days/year): Release fraction to air from process (initial release		10 100	
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor: Local marine water dilution factor:  Operational conditions  Emission days (days/year):	ease prior to	10 100 300	
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor: Local marine water dilution factor:  Operational conditions  Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to wastewater from process	ease prior to (initial release prior	10 100 300 0.025	
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor: Local marine water dilution factor:  Operational conditions  Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to wastewater from process to RMM): Release fraction to soil from process (initial rel RMM):	ease prior to (initial release prior lease prior to	10 100 300 0.025 0.001	
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor: Local marine water dilution factor:  Operational conditions  Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to wastewater from process to RMM): Release fraction to soil from process (initial rel RMM):	ease prior to (initial release prior lease prior to	10 100 300 0.025 0.001 0.0001 discharges, air emissions and releases to soil 0	
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor: Local marine water dilution factor:  Operational conditions  Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to wastewater from process to RMM): Release fraction to soil from process (initial rel RMM): Technical onsite conditions and measures Treat air emission to provide a typical removal Treat onsite wastewater (prior to receiving wastewater (prior to receiving wastewater)	ease prior to (initial release prior lease prior to  to reduce or limit (lefficiency of (%): ter discharge) to	10 100 300 0.025 0.001 0.0001 discharges, air emissions and releases to soil 0 ≥ 87	
Flow rate of receiving surface water (m³/d): Local freshwater dilution factor: Local marine water dilution factor:  Operational conditions  Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to wastewater from process to RMM): Release fraction to soil from process (initial rel RMM): Technical onsite conditions and measures Treat air emission to provide a typical removal Treat onsite wastewater (prior to receiving was provide the required removal efficiency of (%)	ease prior to  (initial release prior lease prior to  to reduce or limit of lefficiency of (%): ter discharge) to :	10 100 300 0.025 0.001 0.0001 discharges, air emissions and releases to soil 0 ≥ 87 If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Flow rate of receiving surface water (m³/d):  Local freshwater dilution factor:  Local marine water dilution factor:  Operational conditions  Emission days (days/year):  Release fraction to air from process (initial rel RMM):  Release fraction to wastewater from process to RMM):  Release fraction to soil from process (initial rel RMM):  Technical onsite conditions and measures  Treat air emission to provide a typical removal provide the required removal efficiency of (%)  Treat soil emission to provide a typical removal	ease prior to  (initial release prior lease prior to  to reduce or limit of lefficiency of (%): ter discharge) to : al efficiency of (%):	10 100 300 0.025 0.001 0.0001 discharges, air emissions and releases to soil 0 ≥ 87 If discharging to domestic sewage treatment plant, no onsite wastewater	
Flow rate of receiving surface water (m³/d):  Local freshwater dilution factor:  Local marine water dilution factor:  Operational conditions  Emission days (days/year):  Release fraction to air from process (initial rel RMM):  Release fraction to wastewater from process to RMM):  Release fraction to soil from process (initial rel RMM):  Technical onsite conditions and measures  Treat air emission to provide a typical removal provide the required removal efficiency of (%)  Treat soil emission to provide a typical removal organisational measures to prevent/limit relations.	ease prior to  (initial release prior lease prior to  to reduce or limit ( I efficiency of (%): ter discharge) to : al efficiency of (%): elease from site	10 100 300 0.025 0.001 0.0001 discharges, air emissions and releases to soil 0 ≥ 87 If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. 0	
Flow rate of receiving surface water (m³/d):  Local freshwater dilution factor:  Local marine water dilution factor:  Operational conditions  Emission days (days/year):  Release fraction to air from process (initial rel RMM):  Release fraction to wastewater from process to RMM):  Release fraction to soil from process (initial rel RMM):  Technical onsite conditions and measures  Treat air emission to provide a typical removal provide the required removal efficiency of (%)  Treat soil emission to provide a typical removal organisational measures to prevent/limit related to prevent/limit related to prevent soil and water to prevent soil	ease prior to  (initial release prior lease prior to  to reduce or limit l efficiency of (%): ter discharge) to : al efficiency of (%): elease from site er pollution in the ev	10 100 300 0.025 0.001 0.0001  discharges, air emissions and releases to soil 0 ≥ 87 If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. 0 ent of spillage. Prevent environmental discharge consistent with regulatory	
Flow rate of receiving surface water (m³/d):  Local freshwater dilution factor:  Local marine water dilution factor:  Operational conditions  Emission days (days/year):  Release fraction to air from process (initial rel RMM):  Release fraction to wastewater from process to RMM):  Release fraction to soil from process (initial rel RMM):  Technical onsite conditions and measures  Treat air emission to provide a typical removal provide the required removal efficiency of (%)  Treat soil emission to provide a typical removal organisational measures to prevent/limit related to prevent/limit related to prevent soil and water to prevent soil	ease prior to  (initial release prior lease prior to  to reduce or limit ( l efficiency of (%): ter discharge) to : al efficiency of (%): elease from site er pollution in the evensure that adequate	10 100 300 0.025 0.001 0.0001  discharges, air emissions and releases to soil  0 ≥ 87 If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.  0 ent of spillage. Prevent environmental discharge consistent with regulatory the safeguards are in place to minimize the impact of episodic releases.	

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Do not allow to enter drains, sewers or water courses.

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

Estimated amount entering waste treatment no greater than: 5%. Suitable waste treatment: Incineration, Removal efficiency (total): 99.98%. Cement fuels, Removal efficiency (total): 99.98%.

To be disposed of as hazardous waste. Dispose of waste product or used containers according to local regulations. External treatment and disposal of waste should comply with applicable local and/or national regulations.

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

Exposure assessment (method/calculation model)

ECETOC TRA model (v3)

ESVOC SpERC 2.2.v1 (modified).

	Inhal	ation	Der	mal	Overall
Process category [PROC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure(mg/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PROC1	0.019	<0.001	0.03	<0.001	<0.001
PROC2	9.6	0.01	1.4	0.004	0.0141
PROC3	19	0.02	0.69	0.002	0.0222
PROC4	38	0.04	6.9	0.02	0.0603
PROC5	96	0.101	14	0.04	0.141
PROC8a	96	0.101	14	0.04	0.141
PROC8b	48	0.05	14	0.04	0.0904
PROC9	96	0.101	6.9	0.02	0.121
PROC15	19	0.02	0.34	<0.001	0.0212

Note: Available hazard data do not enable the derivation of a DNEL for eye irritant effects. Msafe: 1240 te/day.

#### 3.2 Environmental exposure prediction

Exposure assessment (method/calculation model)

ECETOC TRA model (v3)

ESVOC SpERC 2.2.v1 (modified).

environmental exposure	STP	freshwater	marine water	soil	freshwater sediment	marine sediment
Predicted Environmental Exposure	6.32 mg/l	0.577 mg/l	0.0635 mg/l	< 0.0883 mg/kgdw	2.21 mg/kgdw	0.244 mg/kgdw
Risk characterisation ratio (RCR)	1.09E-02	6.01E-01	8.04E-02	< 5.19E-01	6.01E-01	8.05E-02

Indirect exposure to humans via the environment: Negligible

4. Evaluation guidance to downstream user						
For scaling see	algorithm below to estimate the constructed = PECcalculated * (fraction) * (local STP efficiency fraction) *	If the local environmental emission conditions deviate significantly from the used default values, please use the algorithm below to estimate the correct local emissions and RCRs:  PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local street fraction) * (local STP efficiency fraction)  Example for calculating your local freshwater PEC:				
	Corrected local freshwater PEC = 0,185 * (your local emission [kg/day] / 28) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)					
Exposure assessment	Workers	ECETOC TRA model. (v3).				
instrument/tool/method	environmental exposure	ECETOC TRA model (v3)				

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



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