

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

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

1.1 Product identifier

Product Name	ETHANOL
Product Description	V4004a- ANHYDROUS ETHANOL-ETHANOL
Trade Name	ANHYDROUS ETHANOL
Product code	V4004a, BIOETHAN
CAS No.	64-17-5
EC No.	200-578-6
REACH Registration No.	-

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

Identified Use(s)	No.	Exposure Scenario	Page:
	1	Industrial Distribution of Ethanol	9
	2	Industrial formulation and (re)packing of ethanol and its mixtures (fuels)	12

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 P.O. Box 2056 1211 Geneva 1 Switzerland
Telephone	+31 10 498 7200
Fax	+31 10 452 9545
E-Mail (competent person)	xreach@vitol.com

1.4 Emergency telephone number

Emergency Phone No.	+44 (0) 1235 239 670, 24/7
Languages 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

2.2 Label elements

Product Name According to Regulation (EC) No. 1272/2008 (CLP)

V4004a- ANHYDROUS ETHANOL-ETHANOL

Hazard Pictogram(s)



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

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

contaminated clothing. Rinse skin with water/shower.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
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.	REACH Registration No.	%W/W
Ethanol	64-17-5	200-578-6	-	100

SECTION 4: FIRST AID MEASURES



4.1 Description of first aid measures

Self-protection of the first aider

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

Inhalation

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.

Skin Contact

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.

Eye Contact

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.

Ingestion

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.

4.2 Most important symptoms and effects, both acute and delayed

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

4.3 Indication of any immediate medical attention and special treatment needed

Unlikely to be required but if necessary treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable Extinguishing media

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

Unsuitable extinguishing media

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

5.2 Special hazards arising from the substance or mixture

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.

5.3 Advice for fire-fighters

Fight fire with normal precautions from a reasonable distance. Fire fighters should wear complete protective clothing including self-contained breathing

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

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. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
- 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. Take precautionary measures against static discharge. Use only 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** Bund storage facilities to prevent soil and water pollution in the event of spillage. Use explosion proof electrical equipment. Keep only in original container. 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.
- Storage temperature
Storage measures
Keep only in original container. Suitable materials: Carbon steel, Mild steel, Stainless steel, Titanium, Bronze.
- Incompatible materials
Rubber, PVC, Zinc, Brass, Aluminium.
- 7.3 Specific end use(s)** See Section: 1.2 and/or Exposure Scenario.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

- 8.1 Control parameters**
8.1.1 Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
Ethanol	64-17-5	1000	1920	-	-	WEL

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

- 8.1.2 Biological limit value** Not established.
- 8.1.3 PNECs and DNELs**

DNEL MTBE	Oral (mg/kg bw/day)	Inhalation (mg/m ³)	Dermal (mg/kg bw/day)
Industry - Long Term - Systemic effects	-	950	343
Industry - Short term - Local effects	-	1900	-
Consumer - Long Term - Systemic effects	84	114	206
Consumer - Short term - Local effects	-	950	-

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

PNEC	MTBE
Aquatic Compartment	PNEC aqua (freshwater) 0.96 mg/L PNEC aqua (marine water) 0.79 mg/L PNEC aqua (intermittent releases) 2.75 mg/L PNEC STP 580 mg/L PNEC sediment (freshwater) 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.

8.2.2 Individual protection measures, such as personal protective equipment (PPE)

Good hygiene practices and housekeeping measures

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. Ensure the ventilation system is regularly maintained and tested.

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

Appearance	Liquid. Colourless to yellowish liquid.
Odour	Alcohol-like
Odour threshold	Not established.
pH	Not established.
Melting point/freezing point	- 114 °C
Initial boiling point and boiling range	78 °C
Flash point	12-13 °C
Evaporation rate	Not established.
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Flammable Limits (Upper) (%v/v): 19 Flammable Limits (Lower) (%v/v): 3.3
Vapour pressure	5.9 kPa @ 20 °C
Vapour density	1.59
Relative density	0.79 g/cm ³ @ 20 °C
Solubility(ies)	789,000 mg/L at 20 °C - Completely miscible with water.
Partition coefficient: n-octanol/water	- 0.35 log P @ 20 °C
Auto-ignition temperature	363 - 425 °C
Decomposition Temperature	Not established.
Viscosity	1.17 mPa*s @ 40 °C
Explosive properties	Not explosive.(Vapour may create explosive atmosphere.)

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

Oxidising properties Not oxidising.

9.2 Other information None known.

SECTION 10: STABILITY AND REACTIVITY

10.1 Stability and reactivity Stable under normal conditions. Reacts with - Strong oxidising agents, Mineral acids.

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 product(s) Oxides of carbon

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

Ingestion Not classified. LD50 > 2000 mg/kg bw/day (rat) OECD 401

Inhalation Not classified. LC50 > 50 mg/l (rat) OECD 403

Skin Contact Not classified. LD50 > 2000 mg/kg bw/day @ (rabbit)

Skin corrosion/irritation Not classified. OECD 404 (rabbit)

Mean erythema score :0

Mean edema score : 0

Serious eye damage/irritation Eye Irrit. 2 (rabbit); Causes eye irritation. (OECD 405)

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

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

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

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

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.

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

11.2 Other information None.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity Not classified.LC50 >100 mg/l (Daphnia magna) OECD Guideline 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.

12.6 Other adverse effects None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods Dispose of this material and its container as hazardous waste (2008/98/EEC). 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*.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number

ADR/RID	IMDG/ADN
UN 1170	UN 1170

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

14.2	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 as a Marine Pollutant.	
14.6	Special precautions for user	See Section: 2	
14.7	Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	This product is being carried under the scope of MARPOL Annex 1. Special Precautions: Refer to Chapter 7 'Handling and Storage' for special precautions which a user needs to be aware of, or needs to comply with, in connection with transport.	
14.8	Additional Information	Special Provision: 640K 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	None
15.2	Chemical Safety Assessment	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.

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements:

Header and Section 1.3

Page Header	Update version and date. Removed reference to previous regulation.
Section 2	Removed reference to previous regulation.
Section 9	Updated: Partition Coefficient, Solubility(ies)
Section 16	Updated: Annex to the extended Safety Data Sheet (eSDS). Removed reference to previous regulation.

References:

Existing ECHA registration(s) for Ethanol (CAS No. 64-17-5) and Chemical Safety Report.
This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830.

LEGEND

LTEL	Long Term Exposure Limit
STEL	Short Term Exposure Limit
DNEL	Derived No Effect Level
PNEC	Predicted No Effect Concentration
PBT	PBT: Persistent, Bioaccumulative and Toxic
vPvB	very Persistent and very Bioaccumulative
OECD	Organisation for Economic Cooperation and Development

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

Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. Vitol SA gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. Vitol SA accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

Ethanol

CAS No.
EC No.

64-17-5
200-578-6

Summary of Parameters

Physical parameters			
Vapour pressure (hPa)		5726	
Partition Coefficient (log K _{ow})		-0.35 at 20 °C	
Aqueous solubility (mg/l)		789,000 mg/L at 20 °C	
Molecular weight		46.07	
Biodegradability		Readily biodegradable.	
Human Health (DNEL)			
Workers	Short term	Inhalation (mg/m ³)	None
		Dermal (mg/kg bw/day)	None
	Long Term	Inhalation (mg/m ³)	950
		Dermal (mg/kg bw/day)	343
Consumer	Inhalation (mg/m ³)	114	
	Dermal (mg/kg bw/day)	206	
	Oral (mg/kg bw/day)	87	
Environmental Parameters (PNECs)			
freshwater (mg/l)		0.96	
marine water (mg/l)		0.79	
freshwater sediment (mg/kg dry weight)		3.6	
marine sediment (mg/kg dry weight)		Not applicable	
soil (mg/kg dry weight)		0.63	
STP (mg/l)		580	
Secondary Poisoning		0.38 g/kg food	

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

Contents

Number	Title	Page:
Exposure scenario 1	Industrial Distribution of Ethanol	9
Exposure scenario 2	Industrial formulation and (re)packing of ethanol and its mixtures (fuels)	12

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

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

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]	<p>PROC1 Use in closed process, no likelihood of exposure</p> <p>PROC2 Use in closed, continuous process with occasional controlled exposure</p> <p>PROC3 Use in closed batch process (synthesis or formulation)</p> <p>PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises</p> <p>PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</p> <p>PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</p> <p>PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</p> <p>PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</p> <p>PROC15 Use as laboratory reagent</p>
Chemical product category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental release categories [ERC]	ERC2 Formulation of preparations ESVOC SpERC 1.1b.v1 (with modifications)
Specific Environmental Release Categories SPERC	Not applicable

2.0 Operational conditions and risk management measures

2.1 Control of worker exposure

Product characteristics

Physical form of product Liquid (Vapour pressure 0.5-10kPa)

Concentration of substance in product Covers concentrations up to 100%

Human factors not influenced by risk management

None

Frequency and duration of use

Exposure duration per day Covers daily exposures up to 8 hours (unless stated differently). Continuous process.

Exposure duration per year 300 days per year

Other operational conditions affecting worker 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 occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).

Technical conditions of use

All PROC's Indoor use - Handle substance within a closed system. Keep container tightly closed.

Organisational measures

All PROC's Avoid splashing.

Contributing Scenarios

All PROC's: General measures (eye irritants) Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Dermal protection: none.

PROC1 Use in closed process, no likelihood of exposure Continuous process. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100%
Risk Management Measures: None
Local Exhaust Ventilation: None
General ventilation: Not defined

PROC2 Use in closed, continuous process with occasional controlled exposure Continuous release. Emission days (days/year): 300. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100%
Risk Management Measures: None
Local Exhaust Ventilation: None
General ventilation: Not defined

PROC3 Use in closed batch process (synthesis or formulation) Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100%
Risk Management Measures: None

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

	Local Exhaust Ventilation: None General ventilation: Not defined
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities. Equipment cleaning and maintenance.	Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC15 Use as laboratory reagent	Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined

2.2 Control of environmental exposure

Amounts used

Total supply chain	400000 tpa
Fraction emitted to region	0.1
Fraction emitted locally	0.5

Environment factors not influenced by risk management

Flow rate of receiving surface water (m ³ /d):	18,000
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Operational conditions

Emission days (days/year):	300
Release fraction to air from process (initial release prior to RMM):	0.0001
Release fraction to wastewater from process (initial release prior to RMM):	0.00001
Release fraction to soil from process (initial release prior to 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 removal efficiency of (%):	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 removal efficiency of (%):	0

Organisational measures to prevent/limit release from site

Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements. Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.

Conditions and measures related to municipal sewage treatment plant

Size of municipal sewage system/treatment plant (m ³ /d)	2000
Degradation effectiveness (%)	≥ 87

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

Conditions and measures related to external treatment of waste for disposal

Estimated amount entering waste treatment no greater than: 2%. Suitable waste treatment: Incineration, Removal efficiency (total): 99.98%. Cement kiln 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

Process category [PROC]	Inhalation		Dermal		Overall
	inhalation exposure (mg/m ³)	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 (with modifications)

environmental exposure	STP	freshwater	marine water	soil	freshwater sediment	marine sediment
Predicted Environmental Exposure	0.421 mg/l	≤ 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	<p>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: $PEC_{corrected} = PEC_{calculated} * (\text{local emission fraction}) * (\text{local WWTP flow rate fraction}) * (\text{local river flow rate fraction}) * (\text{local STP efficiency fraction})$</p> <p><u>Example for calculating your local freshwater PEC:</u> $Corrected\ freshwater\ PEC = 0.52 * (\text{your local emission [kg/day]} / 15) * (2000 / \text{your local WWTP flow rate [m3/day]}) * (18000 / \text{your local river flow rate [m3/day]}) * ((1 - \text{your local WWTP efficiency})/0.1)$</p>	
Exposure assessment instrument/tool/method	Workers	ECETOC TRA V3.0
	environmental exposure	ECETOC TRA V3.0

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

Exposure Scenario 2 – Industrial formulation and (re)packing of ethanol and its mixtures (fuels)

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 (with modifications).
Specific Environmental Release Categories SPERC	Not applicable

2.0 Operational conditions and risk management measures	
2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid (Vapour pressure 0.5-10kPa)
Concentration of substance in product	Covers concentrations up to 100%
Human factors not influenced by risk management	
None	
Frequency and duration of use	
Exposure duration per day	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.
Exposure duration per year	300 days per year
Other operational conditions affecting worker 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 occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions of use	
All PROC's	Indoor use - Handle substance within a closed system. Keep container tightly closed.
Organisational measures	
All PROC's	Avoid splashing.
Contributing Scenarios	
All PROC's: General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing. Dermal protection: none.
PROC1 Use in closed process, no likelihood of exposure	Continuous process. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC2 Use in closed, continuous process with occasional controlled exposure	Continuous release. Emission days (days/year): 300. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC3 Use in closed batch process (synthesis or formulation)	Continuous process. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

	Local Exhaust Ventilation: None General ventilation: Not defined
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises	Continuous process. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	Continuous process. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	Continuous process. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	Continuous process. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Continuous process. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined
PROC15 Use as laboratory reagent	Continuous process. Indoor use. Duration: > 4 hours. Assumes use at not more than 20°C above ambient temperature, unless stated differently. Concentration: 25-100% Risk Management Measures: None Local Exhaust Ventilation: None General ventilation: Not defined

2.2 Control of environmental exposure

Amounts used

Total supply chain	400000 tpa
Fraction emitted to region	1
Fraction emitted locally	0.075

Environment factors not influenced by risk management

Flow rate of receiving surface water (m ³ /d):	18,000
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

Operational conditions

Emission days (days/year):	300
Release fraction to air from process (initial release prior to RMM):	0.025
Release fraction to wastewater from process (initial release prior to RMM):	0.001
Release fraction to soil from process (initial release prior to RMM):	0.0001

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 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 removal efficiency of (%):	0

Organisational measures to prevent/limit release from site

Bund storage facilities to prevent soil and water pollution in the event of spillage. Prevent environmental discharge consistent with regulatory requirements. Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.

Conditions and measures related to municipal sewage treatment plant

Do not discharge to sewers or drains.

Conditions and measures related to external treatment of waste for disposal

SAFETY DATA SHEET



Revision: 4.1 Date: 10.06.2019

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

ETHANOL V4004a

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

Process category [PROC]	Inhalation		Dermal		Overall
	inhalation exposure (mg/m ³)	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 (with modifications).
--	---

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

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:
 $PEC_{corrected} = PEC_{calculated} * (\text{local emission fraction}) * (\text{local WWTP flow rate fraction}) * (\text{local river flow rate fraction}) * (\text{local STP efficiency fraction})$

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 instrument/tool/method	Workers	ECETOC TRA model. (v3).
	environmental exposure	ECETOC TRA model (v3)