Issue date: 18.04.2018
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Version: 5 EN

EXTENDED SAFETY DATA SHEET

ETHYL ALCOHOL 96 % (v/v),

DENATURED WITH ISOPROPYL ALCOHOL, METHYL ETHYL KETONE AND DENATONIUM BENZOATE

According Regulation (EC) No. 1272/2008 (CLP), Regulation (EC)No. 1907/2006 and Regulation (EU) 2020/878 of 18 June 2020 amending Annex II to Regulation (EC)No. 1907/2006

SECTION 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Identifier

Substance Name:	**Ethyl alcohol (ethanol) denatured with isopropyl alcohol, methyl ethyl ketone and denatonium benzoate (Bitrex)**
Other means of identification:	**Denatured ethanol**
EC Number (EINECS):	200-578-6
Index Number:	603-002-00-5
REACH Registration Number:	01-2119457610-43-XXXX
CAS Number:	64-17-5

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

Relevant identified uses:

Industrial distribution; industrial formulation and (re)packing of Ethanol and its mixtures; consumer use in antifreeze, deicing and screenwash products; consumer use in cosmetic products, etc.

See SECTION 16 for a complete list of uses, for which an exposure scenario is provided as an annex.

DO NOT USE FOR FOOD PURPOSES!

♦ 1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:

VP Brands International S.A. – Essentica Ethanol Factory
5 Dunav Blvd.
4003 Plovdiv
Bulgaria
Tel.:+359 (0)32 606 916 /+359 (0)32 306 783
e-mail: office@vp-brands.com/office@essentica.eu
e-mail of the competent person responsible for SDS: SDS@essentica.eu

♦ 1.4 Emergency telephone number

UMHATEM "N.I.Pirogov", Department of Toxicology, tel: **+359 2 9154 409**,
poison_centre@mail.orbitel.bg
www.pirogov.bg

Working hours: 24/24 hours

SECTION 2: Hazards Identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Flam. Liq. 2, H225 Highly flammable liquid and vapour
Eye Irrit. 2, H319 Causes serious eye irritation

Additional information

For full text of Hazard- and EU Hazard- statements: see Section 16.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

The substance is classified and labelled according to CLP regulation.

Hazard pictograms:



GHS02 GHS07

Signal word: Danger

Hazard statements:

H225 Highly flammable liquid and vapour
H319 Causes serious eye irritation

Precautionary Statement Prevention:

Keep away from heat/sparks/open flames/hot surfaces. — No smoking, **(P210).**
Keep container tightly closed, **(P233).**
Ground/bond container and receiving equipment, **(P240).**
Wear protective gloves/protective clothing/eye protection/face protection, **(P280).**

Precautionary Statement Response:

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower, **(P303+P361+P353).**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing, **(P305+P351+P338).**
In case of fire: Use CO_2, dry powder extinguisher or dispersed water spray for extinction, **(P370+P378).**

Precautionary Statement Storage:
Store in a well-ventilated place. Keep cool, **(P403+P235).**

2.3 Other hazards:

• PBT/vPvB substance: The substance does not meet the criteria for PBT/vPvB (persistent, bioaccumulative and toxic / very persistent and very bioaccumulative) in accordance with Annex XIII to REACH (Regulation (EC) No. 1907/2006).
• Substance included in Annex XIV and Annex XVII of REACH (Regulation (EC) No. 1907/2006): Not applicable.
• Substances included in the list established in accordance with Article 59, paragraph 1, for having endocrine disrupting properties, and whether the substance is a substance identified as having endocrine disrupting properties according to the criteria established in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605: Not applicable.
• Inhalation or ingestion of high concentrations of the substance may cause effects on the central nervous system.The vapours of the product can form explosive mixtures with air.

SECTION 3: Composition/Information on Ingredients

3.1 Substances

Substance Name:	**Ethyl alcohol**
Index Number:	603-002-00-5
REACH Registration Number:	01-2119457610-43-XXXX
EC Number:	200-578-6
CAS No.:	64-17-5
Content:	98,04 % (v/v)
Classification according to Regulation (EC) 1272/2008	Flammable liquid, Category 2, H225 Eye irritation, Category 2, H319

Impurities and additives classified according to Regulation (EC) 1272/2008:

Identification name	*CAS No.*	*EC No (EINECS)*	*Index No*	*Content %*
Isopropyl alcohol	67-63-0	200-661-7	603-117-00-0	0,98 % (v/v)
Methyl ethyl ketone	78-93-3	201-159-0	606-002-00-3	0,98 % (v/v)

Denatonium benzoate (Bitrex)	3734-33-6	223-095-2	-	< 0,001 % (v/v)

3.2 Mixtures

Not applicable.

SECTION 4: First Aid Measures

4.1 Description of first aid measures

Following inhalation: Provide fresh air; consult a doctor in case of complaints.
Following skin contact: Remove contaminated clothes. Rinse skin with water/shower.
Following eye contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Consult an ophthalmologist if needed.
Following ingestion: Rinse mouth and drink plenty of water. Consult a doctor in case of coplaints.

4.2 Most important symptoms and effects, both acute and delayed

Irritant effects, respiratory paralysis, dizziness, narcosis, nausea, vomiting. Chronic ingestion of ethanol may cause liver cirrhosis.

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

No information available.

SECTION 5: Firefighting Measures

5.1 Extinguishing media

Suitable extinguishing media:
CO_2, dry powder extinguisher or dispersed water spray. In cases of larger fires, use dispersed water spray or alcohol resistant foam.
Unsuitable extinguishing media:
Water spray.

5.2 Special hazards arising from the substance or mixture

Combustible. In case of insufficient ventilation and/or when in use it can form flammable or explosive vapor-air mixture.
Hazardous combustion products:
In case of fire, it releases hazardous combustion gases or vapours (CO, CO_2).

5.3 Advice for firefighters

Vapours of the substance are heavier than air and may spread along floors. Beware of reignition. Fight fire with normal precautions from a reasonable distance. Wear self- contained breathing apparatus.

Additional information
Use water spray to cool fire-exposed containers. Do not allow firefighting water to get into surface or groundwater.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Wear protective equipment. Keep unprotected people away.
Removal of ignition sources.
Avoid contact with skin and eyes.
Do not breathe vapour/spray.

6.1.2 For emergency responders

Use personal protective equipment as required. See section 8.

6.2 Environmental precautions:

Do not allow contamination of sewerage/surface water/groundwater.

6.3 Methods and materials for containment and cleaning up

For containment:

Cover drains.

For cleaning up:

Take up spillage with absorbent material (sand, diatomite, acid binders, universal binders, sawdust).

Other information:

Ensure adequate ventilation.
Clean contaminated area.

6.4 Reference to other sections

See Section 10 for information on incompatible materials.
See Section 7 for information on safe handling.
See Section 8 for information on personal protective equipment.
See Section 13 for disposal information.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling:

Protective measures:

Use personal protective equipment.
Avoid vapour/aerosol formation.
Avoid contact with skin and eyes.
Do not breathe vapours.
Ensure adequate ventilation.
Keep container tightly closed.

Measures to prevent fire:

Keep away from sources of ignition, no smoking.
Take precautionary measures against static discharge.
Advice on General Occupational Hygiene:
Do not eat, drink or smoke when using the product. Wash hands before breaks and at the end of the working day.

7.2 Conditions for safe storage, including any incompatibilities
Technical measures and storage conditions:
Store in tightly sealed and properly labeled containers.
Store in a dry, well-ventilated place.
Keep away from direct sunlight, heat and ignition sources.
Keep away from oxidizing agents, acids, bases, peroxides, food, feed and consumer products.
Ground/bond containers.
Incompatible materials: strong oxidants (strong inorganic acids, nitric acid, perchlorides, peroxy compounds, perchloric acid, permanganates, etc.), alkali metals, alkaline earth metals, etc.

Packaging materials: tanks/containers made of stainless steel, titanium, iron, carbon steel, polypropylene, ceramics, glass, nylon
To be avoided: To be avoided: Natural rubber, PVC, methylmethacrylate plastics, polyamides,zinc, brass, aluminium in certain conditions

Requirements for storage rooms and containers:
Recommended storage temperature: < 35 °C.
Storage class: 3

7.3 Specific end use(s): No information available.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control parameters

Occupational exposure limit values (exposure limits at the workplace)

Substance: ETHANOL
CAS No: 64-17-5

Country	Limit value – 8 hours		Limit value – Short term*		Legal basis
	ppm	mg/m³	ppm	mg/m³	
Austria	1000	1900	2000	3800	
Belgium	1000	1907			
Bulgaria		1000			Decree No. 13 of 30 December 2003 on workers' protection from the risks relating to exposure to chemical agents at work.

Denmark	1000	1900	2000	3800	
France	1000	1900	5000	9500	
Germany (AGS)	500	960	1000 (1)	1920 (1)	
Hungary		1900		7600	
Latvia		1000			
Poland		1900			
Sweden	500	1000	1000 (1)	1900 (1)	
Switzerland	500	960	1000	1920	
The Netherlands		260		1900	
USA-NIOSH	1000	1900			
United Kingdom	1000	1920			

Germany (1) 15 minutes average value
Sweden (1) 15 minutes average value
* Short term is 15 minutes unless otherwise specified.

Ethanol (CAS No.: 64-17-5)

- **DNELs**

	Workers				**Consumers**			
Route of exposure	**Acute effect local**	**Acute effects systemic**	**Long-term-local effects**	**Long-term-systemic effects**	**Acute- local effects**	**Acute effects systemic**	**Long-term-local effects**	**Long-term-systemic effects**
Oral	**Not required**					no hazard identified	no hazard identified	87 mg/kg bw/day
Inhalation	1900 mg/m³	no hazard identified	no hazard identified	950 mg/m³	950 mg/m³	no hazard identified	no hazard identified	114 mg/m³
Dermal	no hazard identified	no hazard identified	no hazard identified	343 mg/kg bw/day	no hazard identified	no hazard identified	no hazard identified	206 mg/kg bw/day

- **PNECs**

Environmental protection target	**PNEC**
Fresh water	0,96 mg/L
Freshwater sediments	3.6 mg/kg sediment dw
Marine water	0.79 mg/L
Aqua intermittent release	2,75 mg/L
Soil	0.63 mg/kg soil dw
Sewage treatment plant	580 mg/L

8.1.2 Information on monitoring procedures

Procedures for determination of concentrations of chemical or biological agents in workplace atmospheres according to the requirements of EN 14042:2003, EN 482 and EN 689.

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Do not eat or smoke during work with the substance.
Apply standard hygiene precautions.
Ensure adequate ventilation.
Provide appropriate personal protective equipment.

8.2.2 Personal protective equipment:

8.2.2.1 Eye and face protection

Use suitable safety glasses. The used personal eye protectors must satisfy the requirements of Council Directive 89/686/EEC and the standart EN 166 harmonized under it.



8.2.2.2 Skin protection

Hand protection: Wear suitable protective gloves. The protective gloves to be used must comply with the requirements of Council Directive 89/686/EEC and the standart EN374. For special purposes it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

- **glove material:** Butyl-rubber
- **minimum layer thickness:** 0,7 mm
- **break through time::** ≥ 480 min
- **other protection measures:**
  Wear flame-retardant protective clothing.

8.2.2.3 Respiratory protection:

Respiratory protection necessary at: Aerosol or mist formation. Type A (against organic gases and vapours with a boiling point of >65°C, colour code: brown).

8.2.3 Environmental Exposure Controls

Keep away from drains, surface and groundwater.

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state:	liquid
Colour:	colourless
Odour:	mild but typical alcoholic
Odour threshold:	no information available
pH-value at 20°C:	no information available
Melting point/freezing point:	- 114 °C

Boiling point and boiling range:	78 °C
Flash point:	13 °C
Flammability:	Highly flammable liquid
Upper/lower explosion limits:	
• **Lower explosion limit (LEL)**	3,5 % (v/v)
• **Upper explosion limit (UEL)**	15 % (v/v)
Vapour pressure:	57 hPa at 20 °C
Relative vapour density:	no information available
Density:	784,4 kg/m^3 at 25 °C
Solubility in water:	miscible with water in any proportion
Partition coefficient: n-octanol/water (log KOW):	-0,31
Auto-ignition temperature:	363 °C
Kinematic viscosity:	1,5 mm^2/s при 20 °C
Dinamic viscosity:	1,2 mPas at 20 °C

9.2 Other information

9.2.1 Information with regard to physical hazard classes

The substance is classified as a flammable liquid, Cat. 2, H225. For more information see SECTION 2.

SECTION 10: Stability and Reactivity

10.1 Reactivity

Vapours can form explosive mixtures with air. It can react violently with strong oxidisers.

10.2 Chemical stability

Stable at normal temperature and pressure.

10.3 Possibility of hazardous reactions:

It reacts violently with: alkali metals, alkaline earth metals, acetic anhydride, peroxides, phosphorus oxides, nitric acid, nitrates, perchlorates.

10.4 Conditions to avoid:

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.

10.5 Incompatible materials:

Strong oxidising agents (strong mineral acids, nitric acid, peroxides, perchlorates, etc.), alkali metals, alkaline earth metals.

10.6 Hazardous decomposition products:

Ethanol combustion results in forming of CO and CO_2.

SECTION 11: Toxicological Information

11.1 Information of hazard classes as defined in Regulation (EC) No 1272/2002:

Acute toxicity:

Acute oral toxicity
LD50: 10470 mg/kg bw (Rat)
Method: OECD Guideline 401

Acute inhalation toxicity
LC50 (4 h): 124.7 mg/L air (Rat)
Method: Guideline 403

Acute dermal toxicity
No data available.

All LD50 and LC50 are by some margin above the thresholds for classification for acute toxicity. Therefore the classification criteria for acute toxicity are not met.

Skin corrosion/irritation:
Rabbit
Result: No irritating
Method: OECD Guideline 404
Based on available data, the classification criteria are not met.

Serious eye damage/irritation:
Rabbit
Result: Category 2A (irritating to eyes)
OECD Guideline 405
Classiication acording to Regulation 1272/2008 - Eye Irrit. 2; H319: Causes serious eye irritation.

Respiratory or skin sensitisation:
Respiratory sensitisation
No data available.
Due to the lack of any specific data on respiratory sensitisation and ethanol not being skin sensitiser, no classification for respiratory sensitisation is warranted.

Skin sensitisation
Mouse
Local lymph node assay (LLNA)
Result: negative
Method: equivalent or similar to OECD Guideline 429
Based on available data, the classification criteria for skin sentisation are not met.

Germ cell mutagenicity:
Genotoxicity in vitro
Salmonella typhimurium
Bacterial revers mutation assay (e.g. Ames test)
Result: negative
Method: OECD Guideline 471

Mouse lymphoma L5178Y cells
Mammalian cell gene mutation assay (gene mutation)
Result: negative
Method: OECD Guideline 476

No significant evidence that ethanol is a genotoxic hazard according to the criteria applied normally for the purposes of classification.

Carcinogenicity

Carcinogenicity: oral

Mice (B6C3F1) male/female
Oral: drinking water
Exposure: 2 years (105 weeks) (ad libitum daily)
Females: NOAEL (carcinogenicity) >44000mg/kg
Males: NOAEL (carcinogenicity) >4250mg/kg
Method: EPA OPPTS 870.4200 (Carcinogenicity)
No compelling evidence to warrant a classification of ethanol for cancer in the context of the relevant classification and labelling regulations for chemical substances.

Reproductive toxicity

Mouse
Oral: drinking water
Exposure: Exposure period: 18 weeks
NOAEL: 13800 mg/kg bw/day
Method: OECD Guideline 416
Based on available data, the classification criteria for toxicity for reproduction are not met.

Summary of evaluation of the CMR properties

not classified as mutagenic for germ cells, carcinogenic, nor toxic for reproduction

Specific target organ toxicity - single exposure

No information available.

Specific target organ toxicity - repeated exposure

No information available.

Aspiration hazard

No information available.

Symptoms related to the physical, chemical and toxicological characteristics

If swallowed: Nausea, vomiting, abdominal pain. Causes damage to liver through prolonged or repeated exposure if swallowed.
If in eyes: Causes serious eye irritation.
If inhaled: Vertigo, inebriation, narcosis, breathing difficulties.
If on skin: Repeated or prolonged exposure may cause skin irritation and dermatitis due to the drying properties of the product.

11.2 Information on other hazard

Endocrine disrupting properties

The substance is not defined as having properties that disrupt the functions of the endocrine system. See section 2.3

SECTION 12: Ecological Information

12.1 Toxicity

Acute (short-term) toxicity

Fish:

Pimephales promelas - LC50 (96 h): 14200 mg/L

Aquatic invertebrates:

Ceriodaphnia dubia - LC50 (48 h): 5012 mg/L;
Daphnia magna - LC50 (48 h): 12340 mg/L

Algae and aquatic plants:

Chlorella vulgaris (algae) - EC50 (3 d): 275 mg/L

Bacteria:

Pseudomonas putida - EC3 (16 h): 6500 mg/L

Long-term toxicity

Aquatic invertebrates:

Daphnia magna - NOEC (9 d): 9.6 mg/L

12.2 Persistence and degradability:

Readily biodegradable.

12.3 Bioaccumulative potential:

Partition coefficient n-octanol/water (log Kow) = - 0.35
Based on its low partition co-efficient (log KoW), the substance has a low potential for bioaccumulation.
Bioconcentration factor (BCF): 3.2

12.4 Mobility in soil:

No information available.

12.5 Results of PBT and vPvB assessment

Substance does not meet the criteria, according to Regulation (EC) No 1907/2006, Annex XIII for persistency nor bioaccumulation and toxicity so is neither PBT (persistent, bioaccumulative and toxic) nor vPvB (very persistent and very bioaccumulative).

12.6 Endocrine disrupting properties:

There are no known adverse effects on the environment caused by endocrine disrupting properties of the substance

12.7 Other adverse effects:

No information available

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

Product / Packaging disposal:

Product wastes should be disposed in accordance with the requirements of Directive 2008/98/EC and all applicable local and national regulations.

Sewage disposal-relevant information:

Waste should not be disposed of by release to sewers.

Waste management of containers/packaging

Empty containers may retain some product residues. This material and its container must be disposed of in a safe manner. Empty containers shall be considered, stored, treated and disposed of as hazardous wastes unless otherwise defined by applicable waste regulations.

SECTION 14: Transport Information

14.1	**UN number**	**1170**
14.2	**UN proper shipping name**	**ETHANOL**
14.3	**Transport hazard class(es)**	3 (F1) Flammable liquids
14.4	**Packing group**	II
14.5	**Environmental hazards**:	none

14.6 Special precautions for user

Provisions for dangerous goods (ADR) should be complied.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable

14.8 Information on all the UN Model Regulations

- **Road, rail and inland waterway transport of dangerous goods (ADR, RID, ADN)**

UN number	1170
Proper shipping name	ETHANOL
Details in the transport document	UN1170, ЕТАНОЛ, 3, II, (D/E)
Class	3
Classification code	F1
Packing group	II
Hazard label(s)	3



Special provisions (SP)	144, 601
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1L
Transport quantities (TC)	2
Tunnel Restriction Code (TRC)	D/E
Hazard identification No	33

- **International Maritime Dangerous Goods Code (IMDG)**

UN number	1170
Proper shipping name	ETHANOL
Details in the transport document	UN1170, ETHANOL, 3, II, 12°C c.c.
Class	3
Classification code	II
Hazard label(s)	3



Special provisions (SP)	144
Excepted quantities (EQ)	E2
Limited quantities (LQ)	1L
EmS	F-E, S-D
Stowage category	A

SECTION 15: Regulatory Information

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

- **Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer**
  Not listed.
- **Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals**
  Not listed.
- **Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC**
  Not listed.
- **Directive 2012/18/EU of the European Parliament and of the Council of 4 july 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently**

repealing Council Directive 96/82/EC

Hazard categories in accordance with Regulation (EC) No 1272/2008	Qualifying quantity (tonnes) of dangerous substances for the application of lower-tier and upper-tier requirements	
	Lower-tier requirements	**Upper-tier requirements**
P5c FLAMMABLE LIQUIDS Flammable liquids, Categories 2 or 3 not covered by P5a and P5b	**5000**	**50 000**

- **Commission Delegated Regulation (EU) 2017/2100 of 4 September 2017 setting out scientific criteria for the determination of endocrine-disrupting properties pursuant to Regulation (EU) No 528/2012 of the European Parliament and Council**
  Does not contain
- **Commission Regulation (EU) 2018/605 of 19 April 2018 amending Annex II to Regulation (EC) No 1107/2009 by setting out scientific criteria for the determination of endocrine disrupting properties**
  Does not contain

15.2 Chemical safety assessment:

A chemical safety assessment of this substance has been carried out under Regulation (EC) 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

SECTION 16: Other Information

Indications of changes

Edit version 4:Compliance with Regulation (EC) No. 1907/2006 (REACH) Annex II, as amended by Regulation (EC) 2020/878.

Revision version 5: Update of the Annex to the Safety Data Sheet according to Regulation (EC) No. 1907/2006 – Exposure Scenarios.

The changes that have been made to the previous version of the SDS are marked with purple rhomb - ♦.

Abbreviations and acronyms:

ADR: Accord europeen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road);
AND: Accord europeen relative au transport international des marchandises dangereuses par voies de navigation interieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways);
IMDG: International Maritime Code for Dangerous Goods;
IMO: International Maritime Organization;
EmS: Emergency Shedule;
RID: Reglament concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International Carriage of Dangerous Goods by Rail);
GHS: Globally Harmonized System of Classification and Labelling of Chemicals;
EINECS: European Inventory of Existing Commercial Chemical Substances;
CAS: Chemical Abstracts Service (division of the American Chemical Society);
LC50: Lethal concentration, 50 percent;

LD50: Lethal dose, 50 percent ;
ECx: Effective concentration x%;
NOEC:No observed effect concentration;
OECD: Organisation for Economic Co-operation and Development;
PBT: Persistent, bioaccumulative and toxic;
vPvB: very Persistent and very Bioaccumulative;
Flam. Liq.: Flammable liquid;
Eye Irrit: Eye-irritating;
Skin irrit: skin irritating;
Acute Tox: acute toxicity;
STOT SE: specific target organ toxicity – single exposure;
EUH 066: Repeated exposure may cause skin dryness or cracking.
NOAEL: No observed adverse effect level;
DNEL: Derived no-effect level;
OEL: Occupational exposure limit;
PEC: Predicted environmental concentration;
PNEC: Predicted no-effect concentration;
RCR: Risk characterisation ratio;
SU: Sector of use;
PC: Product category;
PROC: Process category;
ERC: Environmental release category;

Main references and data sources:
Regulation (EC) No 1907/2006 (REACH), as amended by 2015/830/EC
Regulation (EC) No 1272/2008 (CLP, EC GHS)
Regulation (EC) No 2020/278

Relevant H-statements (number and full text):
H225 Highly flammable liquid and vapour
H302 Harmful if swallowed
H315 Causes skin irritation
H319 Causes serious eye irritation
H332 Harmful if inhaled
H335 May cause respiratory irritation

Training advice:
The product should only be handled by trained operators. Provide adequate information and working instructions. Training for safety handling, storage, hygiene, PPE, first aid for chemical exposure, fire prevention and fighting, etc. should be performed.

Department issuing SDS:
Essentica Ethanol Factory – part of VP Brands International S.A.

Additional information:
This information is based on our present knowledge but does not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship. The information is intended to provide guidelines for the safe use of this product, its storage, processing, transport and disposal. Data cannot be transferred to other products.

ANNEX TO THE SAFETY DATA SHEET ACCORDING TO REGULATION (EC) NO 1907/2006 (REACH):

Relevant Exposure Scenarios:

1. **ES1: Exposure scenario for manufacture of substance Ethanol**
2. **ES4: Exposure scenario for industrial use of Ethanol as an intermediate**
3. **ES5: Exposure scenario for industrial use of Ethanol as a processing chemical or extraction solvent**
4. **ES6: Exposure scenario for industrial use of Ethanol, distribution of the substance**
5. **ES7: Exposure scenario for industrial use of Ethanol, preparation and (re)packaging of substances and mixtures. Use as fuel, use as fuel additive diluent**
6. **ES8: Exposure scenario for industrial use of Ethanol, formulation and (re)packaging of substances and mixtures**
7. **ES9: Exposure scenario for industrial use of Ethanol as a solvent**
8. **ES10: Exposure scenario for industrial use of Ethanol as fuel**
9. **ES11: Exposure scenario for professional use of Ethanol as a solvent**
10. **ES12: Exposure scenario for industrial use of Ethanol as fuel**
11. **ES13: Exposure scenario for industrial use of Ethanol as functional liquids**
12. **ES14: Exposure scenario for industrial use of Ethanol in laboratories**
13. **ES15: Exposure scenario for consumer use of Ethanol as (automotive) fuel**
14. **ES16: Exposure scenario for consumer use of Ethanol as a (non-automotive) fuel**
15. **ES17: Exposure scenario for consumer use of products containing Ethanol in small quantities of the substance: <50 g applied per use event**
16. **ES18: Exposure scenario for consumer use of Ethanol as a functional fluids**
17. **ES19: Exposure scenario for consumer use of Ethanol, coating applications**
18. **ES20: Exposure scenario for consumer use of Ethanol, de-icing and anti-icing applications. Use in screenwash products**
19. **ES21: Exposure scenario for consumer use of Ethanol in cleaning agents**
20. **ES22: Exposure scenario for consumer use of Ethanol, other consumer uses**

ES1: Exposure scenario for manufacture of substance Ethanol

Section 1

Title	**Ethanol** **Manufacture of substance** **EC: 64-17-5**
Life cycle stage	**Manufacture**
Environmental Release Category(ies)	**ERC1:** Manufacture of the substance **ESVOC SpERC 1.1v.1.**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC3:** Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition **PROC8b:** Transfer of substance or mixture (charging and discharging) at dedicated facilities **PROC15:** Use as laboratory reagent **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities
Assessment method	Health: Used ECETOC TRA model. (v3). Environment: Used ECETOC TRA model. (v3). Assessment based on measured data

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	400000 (1330000 kg/day.)	
Frequency and duration of use	Continuous process. 300 days per year of operation.	
Environmental factors not influenced by risk management	Local freshwater dilution factor	10
	Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	None.	
	Emission Days (days/year): Continuous release	300

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation. Soil emission controls are not applicable as there is no direct release to soil. Onsite wastewater treatment required. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 87. Assumed industrial waste water treatment plant flow (m3/d): 2000. All waste water and surface water run off from process area must be collected for treatment.	
Organisation 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	Estimated amount entering waste treatment no greater than: 2%	
	Type of treatment suitable for waste: incineration	Removal efficiency (%): 99.98
	Type of treatment suitable for waste: cement kiln fuels	Removal efficiency (%): 99.98
	Treat 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.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other environmental control measures additional to above	None.	

2.2 Control of worker exposure

Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented . Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Handle substance within a closed system.	

Contributing Scenarios	
General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
ES1-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	No other specific measures identified.
ES1-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.
ES1-CS3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	No other specific measures identified.
ES1-CS4: Transfer of substance or mixture (charging and discharging) at dedicated facilities	No other specific measures identified.
ES1-CS5: Use as laboratory reagent	No other specific measures identified.
ES1-CS6: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
ES1-E1: ERC1	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 1.1.v1.).	
	Release fraction to air from process (initial release prior to RMM):	450kg/day
	Release fraction to wastewater from process (initial release prior to RMM):	25kg/day
	Release fraction to soil from process (initial release prior to RMM):	0
	PEC for microorganisms in STP: Risk characterisation ratio:	1.58E+00mg/l 2.72E-03
	Local PEC in surface water: Risk characterisation ratio:	2.29E-01mg/l 2.39E-01
	Local PEC in fresh water sediment: Risk characterisation ratio:	8.78E-01mg/kgdw 2.44E-01

	Local PEC in sea water during emission episode: Risk characterisation ratio:	2.46E-02mg/l 3.11E-02
	Local PEC in marine sediment: Risk characterisation ratio:	9.42E-02mg/kgdw 3.25E-02
	Local PEC in soil: Risk characterisation ratio:	2.62E-02mg/kgdw 4.16E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES1-CS1:**	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 0.019mg/m3 <0.001 0.03mg/kg/day
	Exposure resulting from contributing scenario ES1-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 9.6mg/m3 0.025 1.4mg/kg/day
	Exposure resulting from contributing scenario ES1-CS3:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.69mg/kg/day
	Exposure resulting from contributing scenario ES1-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 48mg/m3 0.126 14mg/kg/day
	Exposure resulting from contributing scenario ES1-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.34mg/kg/day
	Exposure resulting from contributing scenario ES1-CS6:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario	
Environment	Msafe: 42900000kg/day. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. $$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$ where: mspERC: Substance use rate in spERC. EER,spERC: Efficacy of RMM in spERC. Frelease,,spERC: Initial release fraction in spERC. DFspERC: dilution factor of STP effluent in river. msite: Susbstance use rate at site. EER,site: Efficacy of RMM at site. Frelease,,site: Initial release fraction at site. DFsite: dilution factor of STP effluent in river.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES4: Exposure scenario for industrial use of Ethanol as an intermediate

Section 1

Title	**Ethanol** **Use as an intermediate** **EC: 64-17-5**
Life cycle stage **Sector(s) of Use:**	**Use at industrial sites** **SU8:** Manufacture of bulk, large scale chemicals (including petroleum products) **SU9:** Manufacture of fine chemicals
Environmental Release Category(ies)	**ERC6a:** Use of intermediate **ESVOC SpERC 6.1a.v1. (with modifications)**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC3:** Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition **PROC4:** Chemical production where opportunity for exposure arises **PROC8a:** Transfer of substance or mixture (charging and discharging) at non-dedicated facilities **PROC15:** Use as laboratory reagent **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container)
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3). Used ESVOC SpERCs (with modifications)

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	12000 (40000 kg/day.)	
Frequency and duration of use	Continuous process. 300 days per year of operation.	
Environmental factors not influenced by risk management	Local freshwater dilution factor	10
	Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	None.	
	Emission Days (days/year): Continuous release	300

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 87. Assumed industrial waste water treatment plant flow (m3/d): 2000. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Organisation 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	Estimated substance removal from wastewater via domestic sewage treatment (%):	87
	Assumed domestic sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 2%	
	Type of treatment suitable for waste: incineration	Removal efficiency (%): 99.98
	Type of treatment suitable for waste: cement kiln fuels	Removal efficiency (%): 99.98
	Treat 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.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other environmental control measures additional to above	None.	

2.2 Control of worker exposure

Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented . Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Handle substance within a closed system.	

Contributing Scenarios	
General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
ES4-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	No other specific measures identified.
ES4-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.
ES4-CS3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	No other specific measures identified.
ES4-CS4: Chemical production where opportunity for exposure arises	No other specific measures identified.
ES4-CS5: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	No other specific measures identified.
ES4-CS6: Transfer of substance or mixture (charging and discharging) at dedicated facilities	No other specific measures identified.
ES4-CS7: Use as laboratory reagent	No other specific measures identified.
ES4-CS8: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
ES4-E1: ERC6a	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 6.1a.v1. (with modifications).	
	Release fraction to air from process (initial release prior to RMM):	0.01
	Release fraction to wastewater from process (initial release prior to RMM):	0.003
	Release fraction to soil from process (initial release prior to RMM):	0.001

	PEC for microorganisms in STP: Risk characterisation ratio:	7.58E+00mg/l 1.31E-02
	Local PEC in surface water: Risk characterisation ratio:	7.75E-01mg/l 8.07E-01
	Local PEC in fresh water sediment: Risk characterisation ratio:	2.97E-01mg/kgdw 8.25E-01
	Local PEC in sea water during emission episode: Risk characterisation ratio:	8.46E-02mg/l 1.07E-01
	Local PEC in marine sediment: Risk characterisation ratio:	3.24E-01mg/kgdw 1.12E-01
	Local PEC in soil: Risk characterisation ratio:	2.45E-02mg/kgdw 3.89E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES4-CS1:**	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 0.019mg/m3 <0.001 0.03mg/kg/day
	Exposure resulting from contributing scenario ES4-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 9.6mg/m3 0.025 1.4mg/kg/day
	Exposure resulting from contributing scenario ES4-CS3:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.69mg/kg/day
	Exposure resulting from contributing scenario ES4-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 38mg/m3 0.101 6.9mg/kg/day
	Exposure resulting from contributing scenario ES4-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 2.7mg/kg/day
	Exposure resulting from contributing scenario ES4-CS6:	

	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 48mg/m3 0.126 14mg/kg/day
	Exposure resulting from contributing scenario ES4-CS7:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.34mg/kg/day
	Exposure resulting from contributing scenario ES4-CS8:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario

Environment	Msafe: 374000 /day. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. $$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$ where: mspERC: Substance use rate in spERC. EER,spERC: Efficacy of RMM in spERC. Frelease,,spERC: Initial release fraction in spERC. DFspERC: dilution factor of STP effluent in river. msite: Susbstance use rate at site. EER,site: Efficacy of RMM at site. Frelease,,site: Initial release fraction at site. DFsite: dilution factor of STP effluent in river.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES5: Exposure scenario for industrial use of Ethanol as a processing chemical or extraction solvent

Section 1

Title	**Ethanol** **Use as a process chemical or extraction solvent** **EC: 64-17-5**
Life cycle stage **Sector(s) of Use:**	**Use at industrial sites** **SU9:** Manufacture of fine chemicals
Environmental Release Category(ies)	**ERC4:** Use of non-reactive processing aid at industrial site (no inclusion into or onto article) **ESVOC SpERC 1.1.v1. (with modifications)**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC3:** Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition **PROC4:** Chemical production where opportunity for exposure arises **PROC8a:** Transfer of substance or mixture (charging and discharging) at non-dedicated facilities **PROC8b:** Transfer of substance or mixture (charging and discharging) at dedicated facilities **PROC15:** Use as laboratory reagent **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Covers the use a process chemical or extraction solvent, including exposures during use (including product transfer, mixing and preparation plus manual and automated application) and equipment cleaning
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3) Used ESVOC SpERCs A&B table approach

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	5000 (16700 kg/day.)	
Frequency and duration of use	Continuous process. 300 days per year of operation.	
Environmental factors not influenced by risk management	Local freshwater dilution factor	10
	Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	None.	
	Emission Days (days/year): Continuous release	300

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 87. Assumed industrial waste water treatment plant flow (m3/d): 2000. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Organisation 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	Estimated substance removal from wastewater via domestic sewage treatment (%):	87
	Assumed domestic sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 5%	
	Type of treatment suitable for waste: incineration	Removal efficiency (%): 99.98
	Type of treatment suitable for waste: cement kiln fuels	Removal efficiency (%): 99.98
	Treat 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.	
Conditions and measures related to external recovery of waste	Estimated amount entering waste treatment no greater than: 95%. Type of treatment suitable for waste: redistillation.	
Other environmental control measures additional to above	None.	

2.2 Control of worker exposure

Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented . Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Handle substance within a closed system.	

Contributing Scenarios	
General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
ES5-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	No other specific measures identified.
ES5-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.
ES5-CS3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	No other specific measures identified.
ES5-CS4: Chemical production where opportunity for exposure arises	No other specific measures identified.
ES5-CS5: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	No other specific measures identified.
ES5-CS6: Transfer of substance or mixture (charging and discharging) at dedicated facilities	No other specific measures identified.
ES5-CS7: Use as laboratory reagent	No other specific measures identified.
ES5-CS8: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
ES5-E1: ERC4	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 1.1.v1. (with modifications).	
	Release fraction to air from process (initial release prior to RMM):	0.05
	Release fraction to wastewater from process (initial release prior to RMM):	0.003
	Release fraction to soil from process (initial release prior to RMM):	0.0001

	PEC for microorganisms in STP: Risk characterisation ratio:	3.16E+00mg/l 5.45E-03
	Local PEC in surface water: Risk characterisation ratio:	3.73E-01mg/l 3.89E-01
	Local PEC in fresh water sediment: Risk characterisation ratio:	1. 43E+00mg/kgdw 3.97E-01
	Local PEC in sea water during emission episode: Risk characterisation ratio:	4.04E-02mg/l 5.11E-02
	Local PEC in marine sediment: Risk characterisation ratio:	1.55E-01mg/kgdw 5.34E-02
	Local PEC in soil: Risk characterisation ratio:	3.94E-02mg/kgdw 6.25E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES5-CS1:**	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 0.019mg/m3 <0.001 0.03mg/kg/day
	Exposure resulting from contributing scenario ES5-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 9.6mg/m3 0.025 1.4mg/kg/day
	Exposure resulting from contributing scenario ES5-CS3:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.69mg/kg/day
	Exposure resulting from contributing scenario ES5-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 38mg/m3 0.101 6.9mg/kg/day
	Exposure resulting from contributing scenario ES5-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	Exposure resulting from contributing scenario ES5-CS6:	

	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 48mg/m3 0.126 14mg/kg/day
	Exposure resulting from contributing scenario ES5-CS7:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.34mg/kg/day
	Exposure resulting from contributing scenario ES5-CS8:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario

Environment	Msafe: 326000/day. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. $$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$ where: mspERC: Substance use rate in spERC. EER,spERC: Efficacy of RMM in spERC. Frelease,,spERC: Initial release fraction in spERC. DFspERC: dilution factor of STP effluent in river. msite: Susbstance use rate at site. EER,site: Efficacy of RMM at site. Frelease,,site: Initial release fraction at site. DFsite: dilution factor of STP effluent in river.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES6: Exposure scenario for industrial use of Ethanol, distribution of the substance

Section 1

Title	**Ethanol** **Distribution of substance** **EC: 64-17-5**
Life cycle stage	**Formulation or (re)packaging**
Environmental Release Category(ies)	**ERC2: Formulation into mixture** **ESVOC SpERC 1.1b.v1.**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC3:** Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition **PROC4:** Chemical production where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes **PROC8a:** Transfer of substance or mixture (charging and discharging) at non-dedicated facilities **PROC8b:** Transfer of substance or mixture (charging and discharging) at dedicated facilities **PROC15:** Use as laboratory reagent **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3). Used ESVOC SpERCs (with modifications)

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	8000 (30000 kg/day.)	
Frequency and duration of use	Continuous and batch operation. 267 days per year of operation.	
Environmental factors not influenced by risk management	Local freshwater dilution factor	10
	Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	None.	
	Emission Days (days/year):	267

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation. Soil emission controls are not applicable as there is no direct release to soil. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 87. Assumed industrial waste water treatment plant flow (m3/d): 2000. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Organisation 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	Estimated substance removal from wastewater via domestic sewage treatment (%):	87
	Assumed domestic sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	Not applicable. All waste product is assumed to be collected and returned for re-processing or use as a fuel.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other environmental control measures additional to above	None.	

2.2 Control of worker exposure

Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous and batch operation.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented . Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Handle substance within a closed system.	

Contributing Scenarios

General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
ES6-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	No other specific measures identified.

ES6-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.
ES6-CS3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	No other specific measures identified.
ES6-CS4: Chemical production where opportunity for exposure arises	No other specific measures identified.
ES6-CS5: Mixing or blending in batch processes	No other specific measures identified.
ES6-CS6: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	No other specific measures identified.
ES6-CS7: Transfer of substance or mixture (charging and discharging) at dedicated facilities	No other specific measures identified.
ES6-CS8: Use as laboratory reagent	No other specific measures identified.
ES6-CS9: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
ES6-E1: ERC2	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 1.1b.v1.).	
	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
	PEC for microorganisms in STP: Risk characterisation ratio:	1.89E-01mg/l 3.26E-04
	Local PEC in surface water: Risk characterisation ratio:	1.03E-01mg/l 1.07E-01

	Local PEC in fresh water sediment: Risk characterisation ratio:	3.94E-01mg/kgdw 1.09E-01
	Local PEC in sea water during emission episode: Risk characterisation ratio:	1.07E-02mg/l 1.35E-02
	Local PEC in marine sediment: Risk characterisation ratio:	4.09E-02mg/kgdw 1.41E-02
	Local PEC in soil: Risk characterisation ratio:	1.16E-02mg/kgdw 1.84E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES6-CS1:**	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 0.019mg/m3 <0.001 0.03mg/kg/day
	Exposure resulting from contributing scenario ES6-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 9.6mg/m3 0.025 1.4mg/kg/day
	Exposure resulting from contributing scenario ES6-CS3:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.69mg/kg/day
	Exposure resulting from contributing scenario ES6-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 38mg/m3 0.101 6.9mg/kg/day
	Exposure resulting from contributing scenario ES46-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 14mg/kg/day
	Exposure resulting from contributing scenario ES6-CS6:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	Exposure resulting from contributing scenario ES6-CS7:	

	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 48mg/m3 0.126 14mg/kg/day
	Exposure resulting from contributing scenario ES6-CS8:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.34mg/kg/day
	Exposure resulting from contributing scenario ES6-CS9:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario

Environment	Msafe: 22200000/day. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. $$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$ where: mspERC: Substance use rate in spERC. EER,spERC: Efficacy of RMM in spERC. Frelease,,spERC: Initial release fraction in spERC. DFspERC: dilution factor of STP effluent in river. msite: Susbstance use rate at site. EER,site: Efficacy of RMM at site. Frelease,,site: Initial release fraction at site. DFsite: dilution factor of STP effluent in river.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES7: Exposure scenario for industrial use of Ethanol, preparation and (re)packaging of substances and mixtures. Use as fuel, use as fuel additive diluent

Section 1

Title	**Ethanol** **Formulation & (re)packing of substances and mixtures. Use as a fuel, use as a fuel additive diluent** **EC: 64-17-5**
Life cycle stage	**Formulation or (re)packaging**
Environmental Release Category(ies)	**ERC2:** Formulation into mixture **ESVOC SpERC 2.2.v1. (with modifications)**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC3:** Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition **PROC4:** Chemical production where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes **PROC8a:** Transfer of substance or mixture (charging and discharging) at non-dedicated facilities **PROC8b:** Transfer of substance or mixture (charging and discharging) at dedicated facilities **PROC9:** Transfer of substance or mixture into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Use as a fuel. Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3). Used ESVOC SpERCs. (with modifications)

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	20000 (66700 kg/day.)	
Frequency and duration of use	Continuous process. 300 days per year of operation.	
Environmental factors not influenced by risk management	Local freshwater dilution factor	10
	Local marine water dilution factor	100

Other operational conditions of use affecting environmental exposure	None.	
	Emission Days (days/year): Continuous release	300
Technical onsite conditions and measures to reduce or limit discharges, air emissions	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 87. Assumed industrial waste water treatment plant flow (m3/d): 2000. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Organisation 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	Estimated substance removal from wastewater via domestic sewage treatment (%):	87
	Assumed domestic sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	Not applicable. All waste product is assumed to be collected and returned for re-processing or use as a fuel.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other environmental control measures additional to above	None.	

2.2 Control of worker exposure

Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Handle substance within a closed system. Formulation activity is assumed to be a predominantly enclosed process.	

Contributing Scenarios	
General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
ES7-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	No other specific measures identified.
ES7-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.
ES7-CS3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	No other specific measures identified.
ES7-CS4: Chemical production where opportunity for exposure arises	No other specific measures identified.
ES7-CS5: Mixing or blending in batch processes	No other specific measures identified.
ES7-CS6: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	No other specific measures identified.
ES7-CS7: Transfer of substance or mixture (charging and discharging) at dedicated facilities	No other specific measures identified.
ES7-CS8: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	No other specific measures identified.
ES7-CS9: Use as laboratory reagent	No other specific measures identified.
ES7-CS10: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
ES7-E1: ERC2	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 2.2.v1. (with modifications).	
	Release fraction to air from process (initial release prior to RMM):	0.025
	Release fraction to wastewater from process (initial release prior to RMM):	0.0015
	Release fraction to soil from process (initial release prior to RMM):	0.0001

	PEC for microorganisms in STP: Risk characterisation ratio:	6.32E+00mg/l 1.09E-02
	Local PEC in surface water: Risk characterisation ratio:	6.60E-01mg/l 6.88E-01
	Local PEC in fresh water sediment: Risk characterisation ratio:	2.53E+00mg/kgdw 7.03E-01
	Local PEC in sea water during emission episode: Risk characterisation ratio:	7.20E-02mg/l 9.11E-02
	Local PEC in marine sediment: Risk characterisation ratio:	2.76E-01mg/kgdw 9.52E-02
	Local PEC in soil: Risk characterisation ratio:	6.82E-02mg/kgdw 1.08E-01
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES7-CS1:**	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 0.019mg/m3 <0.001 0.03mg/kg/day
	Exposure resulting from contributing scenario ES7-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 9.6mg/m3 0.025 1.4mg/kg/day
	Exposure resulting from contributing scenario ES7-CS3:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.69mg/kg/day
	Exposure resulting from contributing scenario ES7-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 38mg/m3 0.101 6.9mg/kg/day
	Exposure resulting from contributing scenario ES7-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 14mg/kg/day
	Exposure resulting from contributing scenario ES7-CS6:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day

	Exposure resulting from contributing scenario ES7-CS7:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 48mg/m3 0.126 14mg/kg/day
	Exposure resulting from contributing scenario ES7-CS8:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 6.9mg/kg/day
	Exposure resulting from contributing scenario ES7-CS9:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.34mg/kg/day
	Exposure resulting from contributing scenario ES7-CS10:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario

Environment	Msafe: 733000kg/day. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. $$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$ where: mspERC: Substance use rate in spERC. EER,spERC: Efficacy of RMM in spERC. Frelease,,spERC: Initial release fraction in spERC. DFspERC: dilution factor of STP effluent in river. msite: Susbstance use rate at site. EER,site: Efficacy of RMM at site. Frelease,,site: Initial release fraction at site. DFsite: dilution factor of STP effluent in river.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES8: Exposure scenario for industrial use of Ethanol, formulation and (re)packaging of substances and mixtures

Section 1

Title	**Ethanol** **Formulation and (re)packing of substances and mixtures** **EC: 64-17-5**
Life cycle stage	**Formulation or (re)packaging**
Environmental Release Category(ies)	**ERC2:** Formulation into mixture **ESVOC SpERC 2.2.v1. (with modifications)**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC3:** Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition **PROC4:** Chemical production where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes **PROC8a:** Transfer of substance or mixture (charging and discharging) at non-dedicated facilities **PROC8b:** Transfer of substance or mixture (charging and discharging) at dedicated facilities **PROC9:** Transfer of substance or mixture into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3). Used ESVOC SpERCs. (with modifications)

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	17500 (58300 kg/day.)	
Frequency and duration of use	Continuous process. 300 days per year of operation.	
Environmental factors not influenced by risk management	Local freshwater dilution factor	10
	Local marine water dilution factor	100

Other operational conditions of use affecting environmental exposure	None.	
	Emission Days (days/year): Continuous release	300
Technical onsite conditions and measures to reduce or limit discharges, air emissions	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 87. Assumed industrial waste water treatment plant flow (m3/d): 2000. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Organisation 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	Estimated substance removal from wastewater via domestic sewage treatment (%):	87
	Assumed domestic sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	Not applicable. All waste product is assumed to be collected and returned for re-processing or use as a fuel.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other environmental control measures additional to above	None.	

2.2 Control of worker exposure

Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Handle substance within a closed system. Formulation activity is assumed to be a predominantly enclosed process.	

Contributing Scenarios	
General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
ES8-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	No other specific measures identified.
ES8-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.
ES8-CS3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	No other specific measures identified.
ES8-CS4: Chemical production where opportunity for exposure arises	No other specific measures identified.
ES8-CS5: Mixing or blending in batch processes	No other specific measures identified.
ES8-CS6: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	No other specific measures identified.
ES8-CS7: Transfer of substance or mixture (charging and discharging) at dedicated facilities	No other specific measures identified.
ES8-CS8: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	No other specific measures identified.
ES8-CS9: Use as laboratory reagent	No other specific measures identified.
ES8-CS10: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
ES8-E1: ERC2	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 2.2.v1. (with modifications).	
	Release fraction to air from process (initial release prior to RMM):	0.025
	Release fraction to wastewater from process (initial release prior to RMM):	0.0015
	Release fraction to soil from process (initial release prior to RMM):	0.0001

	PEC for microorganisms in STP: Risk characterisation ratio:	5.50E+00mg/l 9.48E-03
	Local PEC in surface water: Risk characterisation ratio:	5.86E-01mg/l 6.10E-01
	Local PEC in fresh water sediment: Risk characterisation ratio:	2.24E+00mg/kgdw 6.22E-01
	Local PEC in sea water during emission episode: Risk characterisation ratio:	6.38E-02mg/l 8.08E-02
	Local PEC in marine sediment: Risk characterisation ratio:	2.44E-01mg/kgdw 8.41E-02
	Local PEC in soil: Risk characterisation ratio:	6.08E-02mg/kgdw 9.65E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES8-CS1:**	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 0.019mg/m3 <0.001 0.03mg/kg/day
	Exposure resulting from contributing scenario ES8-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 9.6mg/m3 0.025 1.4mg/kg/day
	Exposure resulting from contributing scenario ES8-CS3:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.69mg/kg/day
	Exposure resulting from contributing scenario ES8-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 38mg/m3 0.101 6.9mg/kg/day
	Exposure resulting from contributing scenario ES8-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 14mg/kg/day
	Exposure resulting from contributing scenario ES8-CS6:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day

	Exposure resulting from contributing scenario ES8-CS7:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 48mg/m3 0.126 14mg/kg/day
	Exposure resulting from contributing scenario ES8-CS8:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 6.9mg/kg/day
	Exposure resulting from contributing scenario ES8-CS9:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.34mg/kg/day
	Exposure resulting from contributing scenario ES8-CS10:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario

Environment	Msafe: 720000kg/day. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. $$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$ where: mspERC: Substance use rate in spERC. EER,spERC: Efficacy of RMM in spERC. Frelease,,spERC: Initial release fraction in spERC. DFspERC: dilution factor of STP effluent in river. msite: Susbstance use rate at site. EER,site: Efficacy of RMM at site. Frelease,,site: Initial release fraction at site. DFsite: dilution factor of STP effluent in river.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES9: Exposure scenario for industrial use of Ethanol as a solvent

Section 1

Title	**Ethanol** **Industrial use. Use as a solvent** **EC: 64-17-5**
Life cycle stage **Sector(s) of Use:**	**Use at industrial sites** **PC13:** Fuels
Environmental Release Category(ies)	**ERC4:** Use of non-reactive processing aid at industrial site (no inclusion into or onto article) **ESVOC SpERC 4.3a.v1. (with modifications)**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC3:** Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition **PROC4:** Chemical production where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes **PROC7:** Industrial spraying **PROC8a:** Transfer of substance or mixture (charging and discharging) at non-dedicated facilities **PROC8b:** Transfer of substance or mixture (charging and discharging) at dedicated facilities **PROC10:** Roller application or brushing **PROC13:** Treatment of articles by dipping and pouring **PROC15:** Use as laboratory reagent **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Covers use as a processing aid, cleaning agent, solvent or component of a coating, polishes, cleaners etc.). Application methods included: brushing, roller application, treatment by dipping, pouring, immersion or soaking. Application methods include: manual or automated spraying
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3). Used ESVOC SpERCs A&B table approach

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	1500 (5000 kg/day.)	
Frequency and duration of use	Continuous process. 300 days per year of operation.	
Environmental factors not influenced by risk management	Local freshwater dilution factor	10
	Local marine water dilution factor	100

Other operational conditions of use affecting environmental exposure	None.	
	Emission Days (days/year): Continuous release	300
Technical onsite conditions and measures to reduce or limit discharges, air emissions	Treat air emission to provide a typical removal efficiency of (%): 90 Soil emission controls are not applicable as there is no direct release to soil. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): 87. Assumed industrial waste water treatment plant flow (m3/d): 2000. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
Organisation 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.	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	87
	Assumed domestic sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 5%	
	Type of treatment suitable for waste: incineration	Removal efficiency (%): 99.98
	Type of treatment suitable for waste: cement kiln fuels	Removal efficiency (%): 99.98
	Treat 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.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other environmental control measures additional to above	None.	

2.2 Control of worker exposure

Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Handle substance within a closed system.	

Contributing Scenarios	
General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
ES9-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	No other specific measures identified.
ES9-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.
ES9-CS3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	No other specific measures identified.
ES9-CS4: Chemical production where opportunity for exposure arises	No other specific measures identified.
ES9-CS5: Mixing or blending in batch processes	No other specific measures identified.
ES9-CS6: Industrial spraying. Indoor	Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
ES9-CS7: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	No other specific measures identified.
ES9-CS8: Transfer of substance or mixture (charging and discharging) at dedicated facilities	No other specific measures identified.
ES9-CS9: Roller application or brushing	No other specific measures identified.
ES9-CS10: Treatment of articles by dipping and pouring	No other specific measures identified.
ES9-CS11: Use as laboratory reagent	No other specific measures identified.
ES9-CS12: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.

Section 3 Exposure estimation		
Environment	Maximum exposure resulting from contributing scenarios described	
ES9-E1: ERC4	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 4.3a.v1. (with modifications).	
	Release fraction to air from process (initial release prior to RMM):	0.098
	Release fraction to wastewater from process (initial release prior to RMM):	0.02
	Release fraction to soil from process (initial release prior to RMM):	0
	PEC for microorganisms in STP: Risk characterisation ratio:	6.32E+00mg/l 1.09E-02
	Local PEC in surface water: Risk characterisation ratio:	6.60E-01mg/l 6.88E-01
	Local PEC in fresh water sediment: Risk characterisation ratio:	2.53E+00mg/kgdw 7.03E-01
	Local PEC in sea water during emission episode: Risk characterisation ratio:	7.20E-02mg/l 9.11E-02
	Local PEC in marine sediment: Risk characterisation ratio:	2.76E-01mg/kgdw 9.52E-02
	Local PEC in soil: Risk characterisation ratio:	2.76E-02mg/kgdw 4.38E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES9-CS1:**	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 0.019mg/m3 <0.001 0.03mg/kg/day
	Exposure resulting from contributing scenario ES9-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 9.6mg/m3 0.025 1.4mg/kg/day
	Exposure resulting from contributing scenario ES9-CS3:	

	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.69mg/kg/day
	Exposure resulting from contributing scenario ES9-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 38mg/m3 0.101 6.9mg/kg/day
	Exposure resulting from contributing scenario ES9-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 14mg/kg/day
	Exposure resulting from contributing scenario ES9-CS6:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 140mg/m3 0.378 43mg/kg/day
	Exposure resulting from contributing scenario ES9-CS7:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	Exposure resulting from contributing scenario ES9-CS8:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 48mg/m3 0.126 14mg/kg/day
	Exposure resulting from contributing scenario ES9-CS9:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 190mg/m3 0.504 27mg/kg/day
	Exposure resulting from contributing scenario ES9-CS10:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 14mg/kg/day
	Exposure resulting from contributing scenario ES9-CS11:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.34mg/kg/day
	Exposure resulting from contributing scenario ES9-CS12:	

	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 14mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario

Environment	Msafe: 55000kg/day. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. $$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$ where: mspERC: Substance use rate in spERC. EER,spERC: Efficacy of RMM in spERC. Frelease,,spERC: Initial release fraction in spERC. DFspERC: dilution factor of STP effluent in river. msite: Susbstance use rate at site. EER,site: Efficacy of RMM at site. Frelease,,site: Initial release fraction at site. DFsite: dilution factor of STP effluent in river.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES10: Exposure scenario for industrial use of Ethanol as fuel

Section 1

Title	**Ethanol** **Use as a fuel** **EC: 64-17-5**
Life cycle stage **Chemical Products Categories (PC):**	**Use at industrial sites** **PC13:** Fuels
Environmental Release Category(ies)	**ERC7:** Use of functional fluid at industrial site **ESVOC SpERC 7.12a.v1. (with modifications)**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC3:** Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition **PROC8a:** Transfer of substance or mixture (charging and discharging) at non-dedicated facilities **PROC8b:** Transfer of substance or mixture (charging and discharging) at dedicated facilities **PROC15:** Use as laboratory reagent **PROC16:** Use of fuels **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3). Used ESVOC SpERCs. (with modifications)

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	12000 (40000 kg/day.)	
Frequency and duration of use	Continuous process. 300 days per year of operation.	
Environmental factors not influenced by risk management	Local freshwater dilution factor	10
	Local marine water dilution factor	100
Other operational conditions of use affecting environmental exposure	None.	
	Emission Days (days/year): Continuous release	300

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation. Soil emission controls are not applicable as there is no direct release to soil. Do not release wastewater directly into the environment. Onsite wastewater treatment plant is not assumed. Do not release wastewater directly into the environment.	
Organisation 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	
Conditions and measures related to municipal sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	87
	Assumed domestic sewage treatment plant flow (m3/d):	2000
Conditions and measures related to external treatment of waste for disposal	This substance is consumed during use and no waste of the substance is generated. Dispose of waste product or used containers according to local regulations.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other environmental control measures additional to above	None.	

2.2 Control of worker exposure

Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented.	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Handle substance within a closed system.	

Contributing Scenarios	
General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
ES10-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	No other specific measures identified.
ES10-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.
ES10-CS3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	No other specific measures identified.
ES10-CS4: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	No other specific measures identified.
ES10-CS5: Transfer of substance or mixture (charging and discharging) at dedicated facilities	No other specific measures identified.
ES10-CS6: Use as laboratory reagent	No other specific measures identified.
ES10-CS7: Use of fuels	No other specific measures identified.
ES10-CS8: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
ES10-E1: ERC7	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 7.12a.v1. (with modifications).	
	Release fraction to air from process (initial release prior to RMM):	0.0025
	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
	PEC for microorganisms in STP: Risk characterisation ratio:	2.50E-02mg/l 4.31E-05
	Local PEC in surface water: Risk characterisation ratio:	8.78E-02mg/l 9.15E-02

	Local PEC in fresh water sediment: Risk characterisation ratio:	3.36E-01mg/kgdw 9.33E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	9.04E-03mg/l 1.14E-02
	Local PEC in marine sediment: Risk characterisation ratio:	3.46E-02mg/kgdw 1.19E-02
	Local PEC in soil: Risk characterisation ratio:	1.41E-02mg/kgdw 2.24E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES10-CS1:**	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 0.019mg/m3 <0.001 0.03mg/kg/day
	Exposure resulting from contributing scenario ES10-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 9.6mg/m3 0.025 1.4mg/kg/day
	Exposure resulting from contributing scenario ES10-CS3:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.69mg/kg/day
	Exposure resulting from contributing scenario ES10-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	Exposure resulting from contributing scenario ES10-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 48mg/m3 0.126 14mg/kg/day
	Exposure resulting from contributing scenario ES10-CS6:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.34mg/kg/day
	Exposure resulting from contributing scenario ES10-CS7:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 9.6mg/m3 0.025 0.34mg/kg/day

	Exposure resulting from contributing scenario ES10-CS8:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 27mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario

Environment	Msafe: 3460000kg/day. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. $$\frac{m_{spERC} * (1 - E_{ER,spERC}) * F_{release,spERC}}{DF_{spERC}} \geq \frac{m_{site} * (1 - E_{ER,site}) * F_{release,site}}{DF_{site}}$$ where: mspERC: Substance use rate in spERC. EER,spERC: Efficacy of RMM in spERC. Frelease,,spERC: Initial release fraction in spERC. DFspERC: dilution factor of STP effluent in river. msite: Susbstance use rate at site. EER,site: Efficacy of RMM at site. Frelease,,site: Initial release fraction at site. DFsite: dilution factor of STP effluent in river.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES11: Exposure scenario for professional use of Ethanol as a solvent

Section 1

Title	**Ethanol** **Professional use. Use as a solvent** **EC:64-17-5**
Life cycle stage **Chemical Products Categories (PC):**	**Widespread use by professional workers** **PC13:** Fuels
Environmental Release Category(ies)	**ERC8d:** Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor) **ESVOC SpERC 8.3b.v1.**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC3:** Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition **PROC4:** Chemical production where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes **PROC8a:** Transfer of substance or mixture (charging and discharging) at non-dedicated facilities **PROC10:** Roller application or brushing **PROC11:** Non industrial spraying **PROC13:** Treatment of articles by dipping and pouring **PROC19:** Manual activities involving hand contact **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Covers use as a processing aid, cleaning agent, solvent or component of a coating, polishes, cleaners etc.). Application methods included: brushing, roller application, treatment by dipping, pouring, immersion or soaking.. Application methods include: manual or automated spraying
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3). Used ESVOC SpERCs

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	Not applicable. Dispersive use.	
Frequency and duration of use	Continuous process. 365 days per year of operation.	
Other operational conditions of use affecting environmental exposure	None. Dispersive use.	

Technical onsite conditions and measures to reduce or limit discharges, air emissions	Treatment of air emissions is not required for the purposes of REACH compliance but may be needed to comply with other environmental legislation. Do not release wastewater directly into the environment. Onsite wastewater treatment plant is not assumed.	
Organisation measures to prevent/limit release from site	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 10%	
	Type of treatment suitable for waste: incineration	Removal efficiency (%): 99.98
	Treat 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.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other environmental control measures additional to above	None.	

2.2 Control of worker exposure

Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented . Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Keep container tightly closed.	

Contributing Scenarios	
General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
ES11-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	No other specific measures identified.
ES11-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.
ES11-CS3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	No other specific measures identified.
ES11-CS4: Chemical production where opportunity for exposure arises	No other specific measures identified.
ES11-CS5: Mixing or blending in batch processes	No other specific measures identified.
ES11-CS6: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	No other specific measures identified.
ES11-CS7: Roller application or brushing	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) or ensure operation is undertaken outdoors.
ES11-CS8: Non industrial spraying. Indoor	Provide a good standard of controlled ventilation (10 to 15 air changes per hour) or avoid carrying out activities involving exposure for more than 1 hour.
ES11-CS9: Non industrial spraying. Outdoor	Ensure operation is undertaken outdoors. Wear a respirator conforming to EN140 with Type A filter or better. Change filter cartridge on respirator daily.
ES11-CS10: Treatment of articles by dipping and pouring	No other specific measures identified.
ES11-CS11: Manual activities involving hand contact	No other specific measures identified.
ES11-CS12: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.
Section 3 Exposure estimation	
Environment	Maximum exposure resulting from contributing scenarios described
ES11-E1: ERC8d	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 8.3b.v1.).

	Release fraction to air from process (initial release prior to RMM):	0.98
	Release fraction to wastewater from process (initial release prior to RMM):	0.01
	Release fraction to soil from process (initial release prior to RMM):	0.01
	PEC for microorganisms in STP: Risk characterisation ratio:	6.49E-03mg/l 1.12E-05
	Local PEC in surface water: Risk characterisation ratio:	3.32E-02mg/l 3.46E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	1.27E-01mg/kgdw 3.53E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	4.08E-03mg/l 5.16E-03
	Local PEC in marine sediment: Risk characterisation ratio:	1.56E-02mg/kgdw 5.38E-03
	Local PEC in soil: Risk characterisation ratio:	1.40E-02mg/kgdw 2.22E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES11-CS1**:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 0.019mg/m3 <0.001 0.03mg/kg/day
	Exposure resulting from contributing scenario ES11-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 38mg/m3 0.101 1.4mg/kg/day
	Exposure resulting from contributing scenario ES11-CS3:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 48mg/m3 0.126 0.69mg/kg/day
	Exposure resulting from contributing scenario ES11-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 6.9mg/kg/day

	Exposure resulting from contributing scenario ES11-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 190mg/m3 0.504 14mg/kg/day
	Exposure resulting from contributing scenario ES11-CS6:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 190mg/m3 0.504 27mg/kg/day
	Exposure resulting from contributing scenario ES11-CS7:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 270mg/m3 0.706 27mg/kg/day
	Exposure resulting from contributing scenario ES11-CS8:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 290mg/m3 0.757 110mg/kg/day
	Exposure resulting from contributing scenario ES11-CS9:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 67mg/m3 0.177 110mg/kg/day
	Exposure resulting from contributing scenario ES11-CS10:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 190mg/m3 0.504 14mg/kg/day
	Exposure resulting from contributing scenario ES11-CS11:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 190mg/m3 0.504 140mg/kg/day
	Exposure resulting from contributing scenario ES11-CS12:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 190mg/m3 0.504 27mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario	
Environment	Msafe: 1990kg/day. Not applicable for wide dispersive uses.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES12: Exposure scenario for industrial use of Ethanol as fuel

Section 1

Title	**Ethanol** **Use as a fuel** **EC:64-17-5**
Life cycle stage **Chemical Products Categories (PC):**	**Widespread use by professional workers** **PC13:** Fuels
Environmental Release Category(ies)	**ERC9b:** Widespread use of functional fluid (outdoor) **ESVOC SpERC 9.12b.v1.**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC3:** Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition **PROC8a:** Transfer of substance or mixture (charging and discharging) at non-dedicated facilities **PROC8b:** Transfer of substance or mixture (charging and discharging) at dedicated facilities **PROC16:** Use of fuels **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3). Used ESVOC SpERCs

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	Not applicable. Dispersive use.	
Frequency and duration of use	Continuous process. 365 days per year of operation.	
Other operational conditions of use affecting environmental exposure	None. Dispersive use.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions	No air emission controls required; required removal efficiency is 0% Do not release wastewater directly into the environment. Onsite wastewater treatment plant is not assumed.	

Organisation measures to prevent/limit release from site	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to external treatment of waste for disposal	This substance is consumed during use and no waste of the substance is generated. Dispose of waste product or used containers according to local regulations.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other environmental control measures additional to above	None.	
2.2 Control of worker exposure		
Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented.	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Handle substance within a closed system. Keep container tightly closed.	
Contributing Scenarios		
General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.	
ES12-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions	No other specific measures identified.	
ES12-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.	
ES12-CS3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition	No other specific measures identified.	
ES12-CS4: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	No other specific measures identified.	

ES12-CS5: Transfer of substance or mixture (charging and discharging) at dedicated facilities	No other specific measures identified.	
ES12-CS6: Use of fuels	No other specific measures identified.	
ES12-CS7: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.	
Section 3 Exposure estimation		
Environment	Maximum exposure resulting from contributing scenarios described	
ES12-E1: ERC9b	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 9.12b.v1.).	
	Release fraction to air from process (initial release prior to RMM):	0.01
	Release fraction to wastewater from process (initial release prior to RMM):	0.00001
	Release fraction to soil from process (initial release prior to RMM):	0.00001
	PEC for microorganisms in STP: Risk characterisation ratio:	3.11E-05mg/l 5.36E-08
	Local PEC in surface water: Risk characterisation ratio:	3.25E-02mg/l 3.39E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	1.25E-01mg/kgdw 3.47E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	4.02E-03mg/l 5.09E-03
	Local PEC in marine sediment: Risk characterisation ratio:	1.54E-02mg/kgdw 5.31E-03
	Local PEC in soil: Risk characterisation ratio:	1.40E-02mg/kgdw 2.22E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES12-CS1**:	
	Inhalation (vapour) Risk characterisation ratio	8 hour average 0.019mg/m3 <0.001

	Dermal	0.03mg/kg/day
	Exposure resulting from contributing scenario ES12-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 38mg/m3 0.101 1.4mg/kg/day
	Exposure resulting from contributing scenario ES12-CS3:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 48mg/m3 0.126 0.69mg/kg/day
	Exposure resulting from contributing scenario ES12-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 190mg/m3 0.504 27mg/kg/day
	Exposure resulting from contributing scenario ES12-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 96mg/m3 0.252 14mg/kg/day
	Exposure resulting from contributing scenario ES12-CS6:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.34mg/kg/day
	Exposure resulting from contributing scenario ES12-CS7:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 190mg/m3 0.504 27mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario

Environment	Msafe: 9710kg/day. Not applicable for wide dispersive uses.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES13: Exposure scenario for industrial use of Ethanol as functional liquids

Section 1

Title	**Ethanol** **Functional Fluids** **EC:64-17-5**
Life cycle stage **Chemical Products Categories (PC):**	**Widespread use by professional workers** **PC16:** Heat transfer fluids
Environmental Release Category(ies)	**ERC9b:** Widespread use of functional fluid (outdoor) **ESVOC SpERC 9.13b.v1.**
Process Category(ies)	**PROC1:** Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions **PROC2:** Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions **PROC8a:** Transfer of substance or mixture (charging and discharging) at non-dedicated facilities **PROC20:** Use of functional fluids in small devices **PROC28:** Manual maintenance (cleaning and repair) of machinery
Processes, tasks, activities covered	Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in professional equipment including maintenance and related material transfers
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3). Used ESVOC SpERCs

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	Not applicable. Dispersive use.	
Frequency and duration of use	Continuous process. 365 days per year of operation.	
Other operational conditions of use affecting environmental exposure	None. Dispersive use.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions	No air emission controls required; required removal efficiency is 0% Do not release wastewater directly into the environment. Onsite wastewater treatment plant is not assumed.	
Organisation measures to prevent/limit release from site	Prevent environmental discharge consistent with regulatory requirements.	

Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 10% Type of treatment suitable for waste: incineration. Treat 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.
Conditions and measures related to external recovery of waste	Estimated amount entering waste treatment no greater than: 80%. Type of treatment suitable for waste: redistillation
Other environmental control measures additional to above	None.

2.2 Control of worker exposure

Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Keep container tightly closed.	

Contributing Scenarios

General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.
ES13-CS1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. Operation is carried out at elevated temperature (> 20°C above ambient temperature). (elevated temperature. 60C)	No other specific measures identified.
ES13-CS2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	No other specific measures identified.
ES13-CS3: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities	No other specific measures identified.
ES13-CS4: Use of functional fluids in small devices	No other specific measures identified.
ES13-CS5: Manual maintenance (cleaning and repair) of machinery	No other specific measures identified.

Section 3 Exposure estimation		
Environment	Maximum exposure resulting from contributing scenarios described	
ES13-E1: ERC9b	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 9.13b.v1.).	
	Release fraction to air from process (initial release prior to RMM):	0.05
	Release fraction to wastewater from process (initial release prior to RMM):	0.025
	Release fraction to soil from process (initial release prior to RMM):	0.025
	PEC for microorganisms in STP: Risk characterisation ratio:	4.33E-03mg/l 7.47E-06
	Local PEC in surface water: Risk characterisation ratio:	3.29E-02mg/l 3.43E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	1.26E-01mg/kgdw 3.50E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	4.06E-03mg/l 5.14E-03
	Local PEC in marine sediment: Risk characterisation ratio:	1.56E-02mg/kgdw 5.38E-03
	Local PEC in soil: Risk characterisation ratio:	1.40E-02mg/kgdw 2.22E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES13-CS1**:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 0.19mg/m3 <0.001 0.03mg/kg/day
	Exposure resulting from contributing scenario ES13-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 38mg/m3 0.101 1.4mg/kg/day

	Exposure resulting from contributing scenario ES13-CS3:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 190mg/m3 0.504 27mg/kg/day
	Exposure resulting from contributing scenario ES13-CS4:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 38mg/m3 0.101 1.7mg/kg/day
	Exposure resulting from contributing scenario ES13-CS5:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 190mg/m3 0.504 27mg/kg/day
	It is not possible to derive a DNEL for this end point. Available hazard data do not enable the derivation of a DNEL for eye irritant effects.	

Section 4 Guidance to check compliance with the exposure scenario

Environment	Msafe: 534kg/day. Not applicable for wide dispersive uses.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES14: Exposure scenario for industrial use of Ethanol in laboratories

Section 1

Title	**Ethanol** **Use in laboratories** **EC:64-17-5**
Life cycle stage **Chemical Products Categories (PC):**	**Widespread use by professional workers** **PC16:** Heat transfer fluids
Environmental Release Category(ies)	**ERC8a:** Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) **ESVOC SpERC 8.17.v1.**
Process Category(ies)	**PROC10:** Roller application or brushing **PROC15:** Use as laboratory reagent
Processes, tasks, activities covered	Use of small quantities within laboratory settings, including material transfers and equipment cleaning
Assessment method	Health: Used ECETOC TRA model (v3). Environment: Used ECETOC TRA model (v3). Used ESVOC SpERCs

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure	0.5 - 10 kPa at STP
	Substance is a unique structure. Non-hydrophobic. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential.	
Amounts used per site (tonne per year)	Not applicable. Dispersive use.	
Frequency and duration of use	Continuous process. 365 days per year of operation.	
Other operational conditions of use affecting environmental exposure	None. Dispersive use.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions	No air emission controls required; required removal efficiency is 0% Soil emission controls are not applicable as there is no direct release to soil. Do not release wastewater directly into the environment. Onsite wastewater treatment plant is not assumed.	
Organisation measures to prevent/limit release from site	Prevent environmental discharge consistent with regulatory requirements.	
Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 10% Type of treatment suitable for waste: incineration. Prevent environmental discharge consistent with regulatory requirements. Dispose of waste product or used containers according to local regulations.	

Conditions and measures related to external recovery of waste	Not applicable.	
Other environmental control measures additional to above	None.	
2.2 Control of worker exposure		
Product Characteristics	Physical condition	Liquid
	Covers percentage substance in the product	up to 100 %
	Vapour pressure	0.5 - 10 kPa at STP
Amounts used	Not applicable.	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently). Continuous process.	
Human factors not influenced by risk management	None.	
Other operational conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).	
Technical conditions and measures at a process level to prevent release and technical conditions and measures to control dispersion from source towards workers	Keep container tightly closed.	
Contributing Scenarios		
General measures (eye irritants)	Use suitable eye protection. Avoid direct eye contact with product, also via contamination on hands. Avoid splashing.	
ES14-CS1: Roller application or brushing	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).	
ES14-CS2: Use as laboratory reagent	No other specific measures identified.	
Section 3 Exposure estimation		
Environment	Maximum exposure resulting from contributing scenarios described	
ES14-E1: ERC8a	Conditions given in SPERC fact sheet give rise to following releases fractions. (ESVOC SpERC 8.17.v1.).	
	Release fraction to air from process (initial release prior to RMM):	0.5
	Release fraction to wastewater from process (initial release prior to RMM):	0.5
	Release fraction to soil from process (initial release prior to RMM):	0

	PEC for microorganisms in STP: Risk characterisation ratio:	4.33E-02mg/l 7.47E-05
	Local PEC in surface water: Risk characterisation ratio:	3.68E-02mg/l 3.83E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	1.41E-01mg/kgdw 3.92E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	4.45E-03mg/l 5.63E-03
	Local PEC in marine sediment: Risk characterisation ratio:	1.70E-02mg/kgdw 5.86E-03
	Local PEC in soil: Risk characterisation ratio:	1.41E-02mg/kgdw 2.24E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Exposure resulting from contributing scenario ES14-CS1**:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 270mg/m3 0.706 27mg/kg/day
	Exposure resulting from contributing scenario ES14-CS2:	
	Inhalation (vapour) Risk characterisation ratio Dermal	8 hour average 19mg/m3 0.05 0.34mg/kg/day

Section 4 Guidance to check compliance with the exposure scenario

Environment	Msafe: 244kg/day. Not applicable for wide dispersive uses.
Health	No corrections required as all exposures are assumed to be for 8 hours (worse case assessment). No corrections required as all exposures are assumed to be substance concentrations of up to 100%.
	No corrections required as all exposures are assumed to be substance concentrations of up to 100%. No corrections required as all exposures are assumed to be for 8 hours (worse case assessment).

ES15: Exposure scenario for consumer use of Ethanol as (automotive) fuel

Section 1

Title	**Ethanol** **Use as a (automotive) fuel** **CAS: 64-17-5**
Life cycle stage Use Descriptor	**Consumer use** **PC13:** Fuels
Environmental Release Category(ies)	**ERC9b:** Widespread use of functional fluid (outdoor)
Processes, tasks, activities covered	Covers consumer uses in liquid fuels. (automotive)

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure (High volatility)	>10 Pa
	Substance is a unique structure. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential. Vapour pressure: 5726Pa.	
Amounts used. Frequency and duration of use	See specific operational conditions below.	
Conditions and measures related to external treatment of waste for disposal	The substance is completely released to the environment or destroyed during use and no significant waste is generated.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other operational conditions of use affecting environmental exposure	Domestic sewage treatment is not assumed. Wastewater emission controls are not applicable as there is no direct release to wastewater.	
	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100

2.2 Control of worker exposure

Fuels - Liquid: Automotive Refuelling	OC	Unless otherwise stated. Covers concentrations up to: 85%. Covers use up to: 51 times per year. For each use event, covers use amounts up to: 55300g. Covers skin contact area up to: 210cm2. Covers outdoor use. Covers exposure up to: 0.05 hours per event.
	RMM	Avoid using indoors.
Fuels - Liquid Scooter Refuelling	OC	Unless otherwise stated. Covers concentrations up to: 85%. Covers use up to: 51 times per year. For each use event, covers use amounts up to: 3750g. Covers skin contact area up to: 210cm2. Covers outdoor use. Covers exposure up to: 0.033 hours per event.
	RMM	Avoid using indoors.

Fuels - Liquid Garden Equipment - Use	OC	Unless otherwise stated. Covers concentrations up to: 15%. Covers use up to: 25 times per year. For each use event, covers use amounts up to: 750g. Covers skin contact area up to: 210cm2. Covers outdoor use. Covers exposure up to: 2 hours per event.
	RMM	Avoid using indoors.
Fuels - Liquid: Garden Equipment - Refuelling	OC	Unless otherwise stated. Covers concentrations up to: 85%. Covers use up to: 25 times per year. For each use event, covers use amounts up to: 750g. Covers skin contact area up to: 210cm2. Covers use in a one car garage (34 m3) under typical ventilation: Covers exposure up to: 0.05 hours per event.
	RMM	Avoid using in rooms smaller than a garage - room volume of at least: 35m3.
Other operational conditions affecting consumer exposure	Assumes activities are at ambient temperature (unless stated differently). Covers outdoor use.	

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
	ES15-ES1:	
	PEC for microorganisms in STP: Risk characterisation ratio:	0.000259mg/l 4.47E-07
	Local PEC in surface water: Risk characterisation ratio:	0.0325mg/l 3.39E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	0.124mg/kgdw 3.44E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	0.00401mg/l 5.08E-03
	Local PEC in marine sediment: Risk characterisation ratio:	0.0153mg/kgdw 5.28E-03
	Local PEC in soil: Risk characterisation ratio:	0.0139mg/kgdw 2.21E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Fuels Liquid: Automotive Refuelling**	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.275mg/m3 0.00241 1.92mg/m3 0.0168 0.117mg/kg/day 0.000081 0.0169

	Fuels Liquid Scooter Refuelling	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	0.0621mg/m3 0.000544 0.434mg/m3 0.0038 0.117mg/kg/day 0.000081 0.00388
	Fuels Liquid Garden Equipment - Use	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	0.0764mg/m3 0.00067 1.09mg/m3 0.00956 4.13mg/kg/day 0.0014 0.0109
	Fuels Liquid Garden Equipment - Refuelling	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	0.079mg/m3 0.000692 1.12mg/m3 0.00982 0.117mg/kg/day 0.0000398 0.00986

Section 4 Guidance to check compliance with the exposure scenario

Environment	Not applicable for wide dispersive uses.
Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Risk Management Measures are based on qualitative risk characterisation.

ES16: Exposure scenario for consumer use of Ethanol as a (non-automotive) fuel

Section 1

Title	**Ethanol** **Use as a (non-automotive) fuel** **CAS: 64-17-5**
Life cycle stage Use Descriptor	**Consumer use** **PC13:** Fuels
Environmental Release Category(ies)	**ERC9a:** Widespread use of functional fluid (indoor) **ERC9b:** Widespread use of functional fluid (outdoor)
Processes, tasks, activities covered	Covers consumer uses in liquid fuels. (non-automotive)

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure (High volatility)	>10 Pa
	Substance is a unique structure. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential. Vapour pressure: 5726Pa.	
Amounts used. Frequency and duration of use	See specific operational conditions below.	
Conditions and measures related to external treatment of waste for disposal	The substance is completely released to the environment or destroyed during use and no significant waste is generated.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other operational conditions of use affecting environmental exposure	Domestic sewage treatment is not assumed. Wastewater emission controls are not applicable as there is no direct release to wastewater.	
	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100

2.2 Control of worker exposure

Fuels - Liquid: Home space heater fuel. Filling of articles/equipment	OC	Unless otherwise stated. Covers concentrations up to: 100%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 3945g. Covers skin contact area up to: 210cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.03 hours per event
Fuels - Liquid: Lamp oil. Filling of articles/equipment	OC	Unless otherwise stated. Covers concentrations up to: 100%. Covers use up to: 51 times per year. For each use event, covers use amounts up to: 255g. Covers skin contact area up to: 210cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.017 hours per event.
Other operational conditions affecting consumer exposure	Assumes activities are at ambient temperature (unless stated differently). Avoid contact with eyes when using product. Unless otherwise indicated, assumes use with typical ventilation.	

Section 3 Exposure estimation		
Environment	Maximum exposure resulting from contributing scenarios described	
	ES16-ES1:	
	PEC for microorganisms in STP: Risk characterisation ratio:	0.000000865mg/l 1.49E-09
	Local PEC in surface water: Risk characterisation ratio:	0.0325mg/l 3.39E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	0.124mg/kgdw 3.44E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	0.00401mg/l 5.08E-03
	Local PEC in marine sediment: Risk characterisation ratio:	0.0153mg/kgdw 5.28E-03
	Local PEC in soil: Risk characterisation ratio:	0.0139mg/kgdw 2.21E-02
	ES16-ES2:	
	PEC for microorganisms in STP: Risk characterisation ratio:	0.0136mg/l 2.34E-05
	Local PEC in surface water: Risk characterisation ratio:	0.00369mg/l 3.84E-03
	Local PEC in fresh water sediment: Risk characterisation ratio:	0.0141mg/kgdw 3.92E-03
	Local PEC in sea water during emission episode: Risk characterisation ratio:	0.000427mg/l 5.41E-04
	Local PEC in marine sediment: Risk characterisation ratio:	0.00163mg/kgdw 5.62E-04
	Local PEC in soil: Risk characterisation ratio:	0.00104mg/kgdw 1.65E-03
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Fuels Liquid: Home space heater fuel. Filling of articles/equipment**	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio:	 0.305mg/m3 0.00267

	Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	0.305mg/m3 0.00267 0.0276mg/kg/day 0.000133 0.0028
	Fuels Liquid: Lamp oil. Filling of articles/equipment	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.00642mg/m3 0.0000563 0.0449mg/m3 0.000393 0.138mg/kg/day 0.0000956 0.000489

Section 4 Guidance to check compliance with the exposure scenario

Environment	Not applicable for wide dispersive uses.
Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Risk Management Measures are based on qualitative risk characterisation.

ES17: Exposure scenario for consumer use of products containing Ethanol in small quantities of the substance: <50 g applied per use event

Section 1

Title	**Ethanol** **Use in products containing small quantities of the substance: <50g applied per event** **CAS: 64-17-5**
Life cycle stage **Use Descriptor**	**Consumer use** **PC1:** Adhesives, sealants **PC3:** Air care products **PC8:** Biocidal products **PC18:** Ink and toners **PC23:** Leather treatment products **PC24:** Lubricants, greases, release products **PC27:** Plant protection products **PC31:** Polishes and wax blends **PC34:** Textile dyes, and impregnating products
Environmental Release Category(ies)	**ERC8a:** Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) **ERC8d:** Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
Processes, tasks, activities covered	Use in products containing small quantities of substance. For each use event, covers use amounts up to: 50g. per day: <50g. Excludes use in cosmetics and toiletries

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure (High volatility)	>10 Pa
	Substance is a unique structure. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential. Vapour pressure: 5726Pa.	
Amounts used. Frequency and duration of use	See specific operational conditions below.	
Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 10%	
	Removal efficiency (%):	99.8
	Treat as hazardous waste. Type of treatment suitable for waste: approved landfill. Type of treatment suitable for waste: incineration.	
Conditions and measures related to external recovery of waste	No suitable recovery methods available.	
Other operational conditions of use affecting environmental exposure	Assumed domestic sewage treatment plant flow (m3/d):	2000
	Estimated substance removal from wastewater via domestic sewage treatment (%):	87

	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100

2.2 Control of worker exposure

Adhesives, sealants - Glues, hobby use	OC	Unless otherwise stated. Covers concentrations up to: 70%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 35cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 4 hours per event.
Adhesives, sealants - Glue from spray	OC	Unless otherwise stated. Covers concentrations up to: 30%. Covers use up to: 6 times per year. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 35cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 4 hours per event.
Adhesives, sealants - Sealants	OC	Unless otherwise stated. Covers concentrations up to: 30%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 35cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 1 hour per event.
Air care products - Air care, instant action (aerosol sprays)	OC	Unless otherwise stated. Covers concentrations up to: 85%. Covers use up to: 5 times per day. For each use event, covers use amounts up to: 10g. Covers skin contact area up to: 35cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.3 hours per event.
Air care products - Air care, continuous action (solid and liquid)	OC	Unless otherwise stated. Covers concentrations up to: 85%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 0.48g. Covers skin contact area up to: 35cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 24 hours per event.
Biocidal products - Laundry and dish washing products	OC	Unless otherwise stated. Covers concentrations up to: 5%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 857cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.5 hours per event.
Biocidal products - Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	OC	Unless otherwise stated. Covers concentrations up to: 5%. Covers use up to: 125 times per year. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 857cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.3 hours per event.
Biocidal products - Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	OC	Unless otherwise stated. Covers concentrations up to: 90%. Covers use up to: 3 times per day. For each use event, covers use amounts up to: 16.7g. Covers skin contact area up to: 428cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.2 hours per event.
Ink and toners - Inks and toners	OC	Unless otherwise stated. Covers concentrations up to: 50%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 71cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 8 hours per event.
Leather tanning, dye, finishing, impregnation and care products - Polishes, wax/cream (floor, furniture, shoes)	OC	Unless otherwise stated. Covers concentrations up to: 50%. Covers use up to: 29 times per year. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 430cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 1.2 hours per event.

Leather tanning, dye, finishing, impregnation and care products - Polishes, spray (furniture, shoes)	OC	Unless otherwise stated. Covers concentrations up to: 20%. Covers use up to: 8 times per year. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 430cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.3 hours per event.
Lubricants, greases, and release products - Liquids	OC	Unless otherwise stated. Covers concentrations up to: 20%. Covers use up to: 4 times per year. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 468cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.2 hours per event.
Plant protection products	OC	Unless otherwise stated. Covers concentrations up to: 10%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 857cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 4 hours per event. For each use event, assumes swallowed amount of: 0.3g.
Polishes and wax blends - Polishes, wax/cream (floor, furniture, shoes)	OC	Unless otherwise stated. Covers concentrations up to: 50%. Covers use up to: 29 times per year. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 430cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 1.2 hours per event.
Polishes and wax blends - Polishes, spray (furniture, shoes)	OC	Unless otherwise stated. Covers concentrations up to: 10%. Covers use up to: 8 times per year. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 430cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.3 hours per event.
Textile dyes, finishing and impregnating products	OC	Unless otherwise stated, Covers concentrations up to: 10%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 50g. Covers skin contact area up to: 857cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 1 hour per event.
Other operational conditions affecting consumer exposure	Assumes activities are at ambient temperature (unless stated differently). Avoid contact with eyes when using product.	

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
	ES17-ES1:	
	PEC for microorganisms in STP: Risk characterisation ratio:	4.24mg/l 7.31E-03
	Local PEC in surface water: Risk characterisation ratio:	0.418mg/l 4.35E-01
	Local PEC in fresh water sediment: Risk characterisation ratio:	1.6mg/kgdw 4.44E-01
	Local PEC in sea water during emission episode: Risk characterisation ratio:	0.0464mg/l 5.87E-02
	Local PEC in marine sediment: Risk characterisation ratio:	0.178mg/kgdw 6.14E-02
	Local PEC in soil: Risk characterisation ratio:	0.0139mg/kgdw 2.21E-02
	Risk from environmental exposure is driven by freshwater sediment.	

Health	**Adhesives, sealants. Glues, hobby use**	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 111mg/m3 0.973 111mg/m3 0.973 3.28mg/kg/day 0.0159 0.989
	Adhesives, sealants. Glue from spray	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.778mg/m3 0.00682 47.3mg/m3 0.414 1.4mg/kg/day 0.000112 0.415
	Adhesives, sealants. Sealants	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 23.5mg/m3 0.206 23.5mg/m3 0.206 1.4mg/kg/day 0.00679 0.212
	Air care products. Air care, instant action (aerosol sprays)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 20.5mg/m3 0.179 20.5mg/m3 0.179 19.9mg/kg/day 0.0966 0.276

	Air care products. Air care, continuous action (solid and liquid)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 1.41mg/m3 0.0123 1.41mg/m3 0.0123 3.99mg/kg/day 0.0193 0.0317
	Biocidal products. Laundry and dish washing products	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 2.25mg/m3 0.0197 2.25mg/m3 0.0197 0.0563mg/kg/day 0.000273 0.02
	Biocidal products. Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.543mg/m3 0.00476 1.55mg/m3 0.0135 5.63mg/kg/day 0.00956 0.0231
	Biocidal products. Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 15.1mg/m3 0.132 15.1mg/m3 0.132 152mg/kg/day 0.737 0.87

	Ink and toners. Inks and toners	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	86mg/m3 0.754 86mg/m3 0.754 4.69mg/kg/day 0.0227 0.777
	Leather tanning, dye, finishing, impregnation and care products. Polishes, wax/cream (floor, furniture, shoes)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	3.62mg/m3 0.0317 45.3mg/m3 0.397 28.2mg/kg/day 0.0109 0.408
	Leather tanning, dye, finishing, impregnation and care products. Polishes, spray (furniture, shoes)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	0.136mg/m3 0.00119 6.24mg/m3 0.0547 11.3mg/kg/day 0.00119 0.0559
	Lubricants, greases, and release products. Liquids	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	0.0368mg/m3 0.000322 3.36mg/m3 0.0294 1.23mg/kg/day 0.000065 0.0295

	Plant protection products	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Oral: Maximum chronic exposure resulting from contributing scenarios described averaged over a year: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 15.7mg/m3 0.137 15.7mg/m3 0.137 11.2mg/kg/day 0.0543 3mg/kg/day 0.0344 0.226
	Polishes and wax blends. Polishes, wax/cream (floor, furniture, shoes)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 3.62mg/m3 0.0317 45.3mg/m3 0.397 28.2mg/kg/day 0.0109 0.408
	Polishes and wax blends. Polishes, spray (furniture, shoes)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.0684mg/m3 0.0006 3.12mg/m3 0.0273 5.65mg/kg/day 0.000597 0.0279
	Textile dyes, finishing and impregnating products	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 7.83mg/m3 0.0686 7.83mg/m3 0.0686 0.112mg/kg/day 0.000543 0.0692

Section 4 Guidance to check compliance with the exposure scenario	
Environment	Not applicable for wide dispersive uses.
Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Risk Management Measures are based on qualitative risk characterisation.

ES18: Exposure scenario for consumer use of Ethanol as a functional fluids

Section 1

Title	**Ethanol** **Functional Fluids** **CAS: 64-17-5**
Life cycle stage Use Descriptor	**Consumer use** **PC16:** Heat transfer fluids
Environmental Release Category(ies)	**ERC9b:** Widespread use of functional fluid (outdoor)
Processes, tasks, activities covered	Use of sealed items containing functional fluids e.g. transfer oils, hydraulic fluids, refrigerants

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure (High volatility)	>10 Pa
	Substance is a unique structure. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential. Vapour pressure: 5726Pa.	
Amounts used. Frequency and duration of use	See specific operational conditions below.	
Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 50%	
Conditions and measures related to external recovery of waste	Removal efficiency (%):	99.98
	Treat as hazardous waste. Type of treatment suitable for waste: approved landfill. Type of treatment suitable for waste: incineration.	
	Incineration: 40% Treat as hazardous waste. Type of treatment suitable for waste: redistillation.	
Other operational conditions of use affecting environmental exposure	Domestic sewage treatment is not assumed.	
	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100

2.2 Control of worker exposure		
Heat transfer fluids - Liquids	OC	Unless otherwise stated. Covers concentrations up to: 100%. Covers use up to: 4 times per year. For each use event, covers use amounts up to: 2200g. Covers skin contact area up to: 468cm2. Covers outdoor use. Covers exposure up to: 0.17 hours per event.
	RMM	Avoid using indoors.
Other operational conditions affecting consumer exposure	Assumes activities are at ambient temperature (unless stated differently). Avoid contact with eyes when using product.	

Section 3 Exposure estimation		
Environment	Maximum exposure resulting from contributing scenarios described	
	ES18-ES1:	
	PEC for microorganisms in STP: Risk characterisation ratio:	0.00216mg/l Not applicable
	Local PEC in surface water: Risk characterisation ratio:	0.0327mg/l 3.41E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	0.125mg/kgdw 3.47E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	0.00403mg/l 5.10E-03
	Local PEC in marine sediment: Risk characterisation ratio:	0.0154mg/kgdw 5.31E-03
	Local PEC in soil: Risk characterisation ratio:	0.0139mg/kgdw 2.21E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Heat transfer fluids. Liquids**	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.0161mg/m3 0.000142 1.48mg/m3 0.0129 61.5mg/kg/day 0.00327 0.0162

Section 4 Guidance to check compliance with the exposure scenario	
Environment	Not applicable for wide dispersive uses.
Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Risk Management Measures are based on qualitative risk characterisation.

ES19: Exposure scenario for consumer use of Ethanol, coating applications

Section 1

Title	**Ethanol** **Uses in Coatings** **CAS: 64-17-5**
Life cycle stage **Use Descriptor**	**Consumer use** **PC9a: Coatings and paints, thinners, paint removers** **PC9b:** Fillers, putties, plasters, modelling clay **PC9c:** Finger paints
Environmental Release Category(ies)	**ERC8a:** Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) **ERC8d:** Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
Processes, tasks, activities covered	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation), and equipment cleaning, maintenance and associated laboratory activities

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure (High volatility)	>10 Pa
	Substance is a unique structure. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential. Vapour pressure: 5726Pa.	
Amounts used. Frequency and duration of use	See specific operational conditions below.	
Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 10%	
	Removal efficiency (%):	99.8
	Treat as hazardous waste. Type of treatment suitable for waste: incineration.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other operational conditions of use affecting environmental exposure	Assumed domestic sewage treatment plant flow (m3/d):	2000
	Estimated substance removal from wastewater via domestic sewage treatment (%):	87
	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100

2.2 Control of worker exposure		
Coatings and paints, fillers putties, thinners - Waterborne latex wall paint	OC	Unless otherwise stated. Covers concentrations up to: 1%. Covers use up to: 4 times per year. For each use event, covers use amounts up to: 2760g. Covers skin contact area up to: 428cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 2.2 hours per event.
Coatings and paints, fillers putties, thinners - Solvent rich, high solid, water borne paint	OC	Unless otherwise stated. Covers concentrations up to: 10%. Covers use up to: 6 times per year. For each use event, covers use amounts up to: 744g. Covers skin contact area up to: 428cm2. Covers use in room size of: 20m3. Covers exposure up to: 2.2 hours per event.
	RMM	Avoid using when windows closed. Avoid using in room with closed doors.
Coatings and paints, fillers putties, thinners - Aerosol spray can	OC	Unless otherwise stated. Covers concentrations up to: 20%. Covers use up to: 2 times per year. For each use event, covers use amounts up to: 215g. Covers skin contact area up to: 254cm2. Covers use in a one car garage (34 m3) under typical ventilation: Covers exposure up to: 0.5 hours per event.
	RMM	Avoid using in rooms smaller than a garage - room volume of at least: 35m3.
Coatings and paints, fillers putties, thinners - Removers (paint, glue, wall paper, sealant-remover)	OC	Unless otherwise stated. Covers concentrations up to: 20%. Covers use up to: 3 times per year. For each use event, covers use amounts up to: 491g. Covers skin contact area up to: 857cm2. Covers use in room size of: 20m3. Covers exposure up to: 2.5 hours per event.
	RMM	Avoid using when windows closed. Avoid using in room with closed doors.
Fillers, putties, plasters, modeling clay - Fillers and putty	OC	Unless otherwise stated. Covers concentrations up to: 2%. Covers use up to: 12 times per year. For each use event, covers use amounts up to: 85g. Covers skin contact area up to: 35cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 4 hours per event.
Fillers, putties, plasters, modeling clay - Plasters and floor equalizers	OC	Unless otherwise stated. Covers concentrations up to: 2%. Covers use up to: 12 times per year. For each use event, covers use amounts up to: 4140g. Covers skin contact area up to: 857cm2. Covers use in room size of: 20m3. Covers exposure up to: 2.5 hours per event.
	RMM	Avoid using when windows closed. Avoid using in room with closed doors.
Fillers, putties, plasters, modeling clay - Modelling clay	OC	Unless otherwise stated. Covers concentrations up to: 1%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 100g. Covers skin contact area up to: 254cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 2 hours per event. For each use event, assumes swallowed amount of: 1g.
Finger paints	OC	Unless otherwise stated. Covers concentrations up to: 10%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 100g. Covers skin contact area up to: 254cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 2.2 hours per event. For each use event, assumes swallowed amount of: 0.2g.
Other operational conditions affecting consumer exposure	Assumes activities are at ambient temperature (unless stated differently).	

Section 3 Exposure estimation		
Environment	Maximum exposure resulting from contributing scenarios described	
	ES19-ES1:	
	PEC for microorganisms in STP: Risk characterisation ratio:	0.000865mg/l 1.49E-06
	Local PEC in surface water: Risk characterisation ratio:	0.0326mg/l 3.40E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	0.124mg/kgdw 3.44E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	0.00402mg/l 5.09E-03
	Local PEC in marine sediment: Risk characterisation ratio:	0.0154mg/kgdw 5.31E-03
	Local PEC in soil: Risk characterisation ratio:	0.0139mg/kgdw 2.21E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Coatings and paints, fillers putties, thinners. Waterborne latex wall paint**	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.772mg/m3 0.00677 70.2mg/m3 0.615 0.563mg/kg/day 0.00003 0.615
	Coatings and paints, fillers putties, thinners. Solvent rich, high solid, water borne paint	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.988mg/m3 0.00866 61.7mg/m3 0.541 5.63mg/kg/day 0.000437 0.541

	Coatings and paints, fillers putties, thinners. Aerosol spray can	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.0927mg/m3 0.000813 18.5mg/m3 0.162 6.69mg/kg/day 0.000162 0.162
	Coatings and paints, fillers putties, thinners. Removers (paint, glue, wall paper, sealant-remover)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.671mg/m3 0.00588 81.6mg/m3 0.715 22.5mg/kg/day 0.000898 0.716
	Fillers, putties, plasters, modeling clay. Fillers and putty	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 0.176mg/m3 0.00154 5.36mg/m3 0.047 0.0939mg/kg/day 0.0000149 0.047
	Fillers, putties, plasters, modeling clay. Plasters and floor equalizers	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	 2.26mg/m3 0.0198 68.7mg/m3 0.603 2.25mg/kg/day 0.000359 0.603

	Fillers, putties, plasters, modeling clay. Modelling clay	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Oral: Maximum chronic exposure resulting from contributing scenarios described averaged over a year: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	2.42mg/m3 0.0212 2.42mg/m3 0.0212 2mg/kg/day 0.0097 0.999mg/kg/day 0.0114 0.0424
	Finger paints	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Oral: Maximum chronic exposure resulting from contributing scenarios described averaged over a year: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	25.4mg/m3 0.222 25.4mg/m3 0.222 10mg/kg/day 0.0485 2mg/kg/day 0.0229 0.294

Section 4 Guidance to check compliance with the exposure scenario

Environment	Not applicable for wide dispersive uses.
Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Risk Management Measures are based on qualitative risk characterisation.

ES20: Exposure scenario for consumer use of Ethanol, de-icing and anti-icing applications. Use in screenwash products

Section 1

Title	**Ethanol** **De-icing and anti-icing applications. Use in screenwash products** **CAS: 64-17-5**
Life cycle stage **Use Descriptor**	**Consumer use** **PC4:** Anti-Freeze and de-icing products
Environmental Release Category(ies)	**ERC8d:** Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
Processes, tasks, activities covered	De-icing of vehicles and similar equipment by spraying. Use in screenwash products

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure (High volatility)	>10 Pa
	Substance is a unique structure. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential. Vapour pressure: 5726Pa.	
Amounts used. Frequency and duration of use	See specific operational conditions below.	
Conditions and measures related to external treatment of waste for disposal	The substance is completely released to the environment or destroyed during use and no significant waste is generated.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other operational conditions of use affecting environmental exposure	Domestic sewage treatment is not assumed.	
	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100

2.2 Control of worker exposure

Anti-freeze and de-icing products - Washing car window	OC	Unless otherwise stated. Covers concentrations up to: 90%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 50g. Covers outdoor use. Covers exposure up to: 0.017 hours per event.
	RMM	Avoid using indoors.

Anti-freeze and de-icing products - Pouring into radiator	OC	Unless otherwise stated. Covers concentrations up to: 80%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 2000g. Covers skin contact area up to: 428cm2. Covers use in a one car garage (34 m3) under typical ventilation: Covers exposure up to: 0.1 hours per event.
	RMM	Avoid using in rooms smaller than a garage - room volume of at least: 35m3.
Anti-freeze and de-icing products - Lock de-icer	OC	Unless otherwise stated. Covers concentrations up to: 50%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 4g. Covers skin contact area up to: 214cm2. Covers use in a one car garage (34 m3) under typical ventilation: Covers exposure up to: 0.25 hours per event.
	RMM	Avoid using in rooms smaller than a garage - room volume of at least: 35m3.
Other operational conditions affecting consumer exposure	Assumes activities are at ambient temperature (unless stated differently). Avoid contact with eyes when using product.	

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
	ES20-ES1:	
	PEC for microorganisms in STP: Risk characterisation ratio:	0.302mg/l Not applicable
	Local PEC in surface water: Risk characterisation ratio:	0.0627mg/l 6.53E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	0.24mg/kgdw 6.67E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	0.00704mg/l 8.91E-03
	Local PEC in marine sediment: Risk characterisation ratio:	0.0269mg/kgdw 9.28E-03
	Local PEC in soil: Risk characterisation ratio:	0.0151mg/kgdw 2.40E-02
	Risk from environmental exposure is driven by freshwater sediment.	
Health	**Anti-freeze and de-icing products. Washing car window**	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Combined routes: Risk characterisation ratio:	 0.317mg/m3 0.00278 0.317mg/m3 0.00278 0mg/kg/day 0.00278

	Anti-freeze and de-icing products. Pouring into radiator	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	3.06mg/m3 0.0268 3.06mg/m3 0.0268 45mg/kg/day 0.218 0.245
	Anti-freeze and de-icing products. Lock de-icer	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	0.51mg/m3 0.00447 0.51mg/m3 0.00447 14mg/kg/day 0.0679 0.0724

Section 4 Guidance to check compliance with the exposure scenario

Environment	Not applicable for wide dispersive uses.
Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Risk Management Measures are based on qualitative risk characterisation.

ES21: Exposure scenario for consumer use of Ethanol in cleaning agents

Section 1

Title	**Ethanol** **Use in Cleaning Agents** **CAS: 64-17-5**
Life cycle stage Use Descriptor	**Consumer use** **PC35:** Washing and cleaning products
Environmental Release Category(ies)	**ERC8a:** Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) **ERC8d:** Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
Processes, tasks, activities covered	Covers general exposures to consumers arising from the use of household products sold as washing and cleaning products, aerosols, coatings, de-icers, lubricants and air care products

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure (High volatility)	>10 Pa
	Substance is a unique structure. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential. Vapour pressure: 5726Pa.	
Amounts used. Frequency and duration of use	See specific operational conditions below.	
Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 10%	
	Removal efficiency (%):	99.8
	Type of treatment suitable for waste: approved landfill. Type of treatment suitable for waste: incineration.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other operational conditions of use affecting environmental exposure	Assumed domestic sewage treatment plant flow (m3/d):	2000
	Estimated substance removal from wastewater via domestic sewage treatment (%):	87
	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100

2.2 Control of worker exposure		
Washing and cleaning products (including solvent based products) - Laundry and dish washing products	OC	Unless otherwise stated. Covers concentrations up to: 5%. Covers use up to: 1 time per day. For each use event, covers use amounts up to: 15g. Covers skin contact area up to: 857cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.5 hours per event.
Washing and cleaning products (including solvent based products) - Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	OC	Unless otherwise stated. Covers concentrations up to: 95%. Covers use up to: 125 times per year. For each use event, covers use amounts up to: 20g. Covers skin contact area up to: 857cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.33 hours per event.
Washing and cleaning products (including solvent based products) - Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	OC	Unless otherwise stated. Covers concentrations up to: 95%. Covers use up to: 125 times per year. For each use event, covers use amounts up to: 20g. Covers skin contact area up to: 428cm2. Covers use in room size of: 20m3. Covers use under typical household ventilation. Covers exposure up to: 0.17 hours per event.
Other operational conditions affecting consumer exposure	Assumes activities are at ambient temperature (unless stated differently).	

Section 3 Exposure estimation

Environment	Maximum exposure resulting from contributing scenarios described	
	ES21-ES1:	
	PEC for microorganisms in STP: Risk characterisation ratio:	0.0151mg/l 2.60E-05
	Local PEC in surface water: Risk characterisation ratio:	0.034mg/l 3.54E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	0.13mg/kgdw 3.61E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	0.00416mg/l 5.27E-03
	Local PEC in marine sediment: Risk characterisation ratio:	0.0159mg/kgdw 5.48E-03
	Local PEC in soil: Risk characterisation ratio:	0.014mg/kgdw 2.22E-02
	Risk from environmental exposure is driven by freshwater sediment.	

Health	**Washing and cleaning products (including solvent based products). Laundry and dish washing products**	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	0.672mg/m3 0.00589 0.672mg/m3 0.00589 0.0563mg/kg/day 0.000273 0.00616
	Washing and cleaning products (including solvent based products). Cleaners, liquids (all purpose cleaners, sanitary products, floor cleaners, glass cleaners, carpet cleaners, metal cleaners)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	4.13mg/m3 0.0363 11.8mg/m3 0.103 107mg/kg/day 0.181 0.285
	Washing and cleaning products (including solvent based products). Cleaners, trigger sprays (all purpose cleaners, sanitary products, glass cleaners)	
	Inhalation (vapour). Chronic inhalation exposure based on a yearly average: Risk characterisation ratio: Acute inhalation exposure based on a single 24hr day: Risk characterisation ratio: Dermal: Chronic systemic dermal exposure: Risk characterisation ratio: Combined routes: Risk characterisation ratio:	2.23mg/m3 0.0195 6.39mg/m3 0.056 53.4mg/kg/day 0.0907 0.146

Section 4 Guidance to check compliance with the exposure scenario

Environment	Not applicable for wide dispersive uses.
Health	Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Risk Management Measures are based on qualitative risk characterisation.

ES22: Exposure scenario for consumer use of Ethanol, other consumer uses

Section 1

Title	**Ethanol** **Other Consumer Uses** **CAS: 64-17-5**
Life cycle stage **Use Descriptor**	**Consumer use** **PC28:** Perfumes, fragrances **PC39:** Cosmetics, personal care products
Environmental Release Category(ies)	**ERC8a:** Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
Processes, tasks, activities covered	Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation

Section 2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Product Characteristics	Physical condition	Liquid
	Vapour pressure (High volatility)	>10 Pa
	Substance is a unique structure. Miscible in water. Practically non-toxic to aquatic species. Readily biodegradable. Low bioaccumulation potential. Vapour pressure: 5726Pa.	
Amounts used. Frequency and duration of use	See specific operational conditions below.	
Conditions and measures related to external treatment of waste for disposal	Estimated amount entering waste treatment no greater than: 10% Type of treatment suitable for waste: approved landfill. Type of treatment suitable for waste: incineration.	
Conditions and measures related to external recovery of waste	Not applicable.	
Other operational conditions of use affecting environmental exposure	Wastewater emission controls are not applicable as there is no direct release to wastewater.	

2.2 Control of worker exposure

Other operational conditions affecting consumer exposure	Not applicable.

Section 3 Exposure estimation		
Environment	Maximum exposure resulting from contributing scenarios described	
	ES22-ES1:	
	PEC for microorganisms in STP: Risk characterisation ratio:	0mg/l Not applicable
	Local PEC in surface water: Risk characterisation ratio:	0.0325mg/l 3.39E-02
	Local PEC in fresh water sediment: Risk characterisation ratio:	0.124mg/kgdw 3.44E-02
	Local PEC in sea water during emission episode: Risk characterisation ratio:	0.00401mg/l 5.08E-03
	Local PEC in marine sediment: Risk characterisation ratio:	0.0153mg/kgdw 5.28E-03
	Local PEC in soil: Risk characterisation ratio:	0.0139mg/kgdw 2.21E-02
	Risk from environmental exposure is driven by freshwater sediment.	

Section 4 Guidance to check compliance with the exposure scenario	
Environment	Not applicable for wide dispersive uses.
Health	Not applicable.