SECTION 1. IDENTIFICATION OF SUBSTANCE / MIXTURE AND COMPANY / UNDERTAKING

Product Identifier

ETHANOL

CAS No. 64-17-5 EC No. 200-578-6 Index No. 603-002-00-5

Synonym (s)

Ethyl alcohol

REACH Registration Number

01-2119457610-43-0082

Relevant identified uses and uses advised against

Industrial and Professional:
Manufacture, formulation and (re)packing, intermediate, processing, fuel and fuel additives, laboratory reagent, heat transfer fluid. (Exposure Scenarios 1 –9, 17, 18)
ES1: Exposure Scenario for Industrial manufacturing of Ethanol, or use as intermediate or process chemical
ES2: Exposure Scenario for Industrial distribution of Ethanol
ES3: Exposure Scenario for Industrial formulation and (re)packing of Ethanol, and its mixtures
ES4: Exposure Scenario for Industrial use of Ethanol in non-spray applications
ES5: Exposure Scenario for Industrial use of Ethanol in spray applications
ES6: Exposure Scenario for Industrial use of Ethanol as fuel source
ES7: Exposure Scenario for Professional use of Ethanol as fuel source
ES8: Exposure Scenario for Professional use of Ethanol in non-spray applications
ES9: Exposure Scenario for Professional use of Ethanol in spray applications
ES17: Exposure Scenario for Industrial and Professional use of Ethanol as laboratory agent
ES18: Exposure Scenario for Industrial and Professional use of Ethanol as heat transfer fluid, or other functional fluid
Consumer:
Fuels, coatings and paint, antifreeze, deicing and screenwash products, washing and cleaning products. (Exposure Scenarios 10 – 16)
ES10: Exposure Scenario for Consumer use of Ethanol as automotive fuel
ES11: Exposure Scenario for Consumer use of Ethanol as domestic fuel
ES12: Exposure Scenario for Consumer use of Ethanol in products (<50g per event)
ES13: Exposure Scenario for Consumer use of Ethanol in enclosed systems
ES14: Exposure Scenario for Consumer use of Ethanol in coatings and paints
ES15: Exposure Scenario for Consumer use of Ethanol in antifreeze, deicing and screenwash products
ES16: Exposure Scenario for Consumer use of Ethanol in washing and cleaning products
Avoid any use:
None reported.

Details of the supplier

ECOFUEL SPA
Via F. Maritano, 26
S. Donato Milanese Telephone: + 39 02 520 56147
ITALY

e-mail address

REACH@ecofuel.eni.it

Emergency Telephone number

+ 39 0382 24444

SECTION 2. HAZARDS IDENTIFICATION

Classification (EC 1272/2008)
2.6 — Flammable liquids, Hazard Category 2
3.3 — Serious eye damage/eye irritation, Hazard Category 2

Classification (67/548/EEC)
HIGHLY FLAMMABLE R11

Label Elements:

Signal Word
DANGER

Hazard Statements

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

Precautionary Statements

P210	Keep away from heat/sparks/open flames/... /hot surfaces.... No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/... / equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P370+P378	In case of fire: Use... for extinction. (Dry chemical, alcohol foam, all-purpose AFFF, carbon dioxide or water spray)
P264	Wash... thoroughly after handling. (hands)
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.
P403+P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/container to...

Supplemental information
Not applicable

Other hazards
Not classified for PBT and vPvB, based on the assessment carried out according to Annex XIII of REACH regulation.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical name	CAS No	EC No	REACH Reg No	Classification				Conc'n %
* Ethanol	64-17-5	200-578-6	01-2119457610-43-0082	Dgr	GHS02	H225	2.6/1	>95
					GHS07	H319	3.3/2	
				F	R11			

Further information
* THE SUBSTANCE HAS AN OCCUPATIONAL EXPOSURE LIMIT.
Key to abbreviations, hazard statements and risk phrases in Section 16

SECTION 4. FIRST AID MEASURES

Description of first aid measures	Take measures to avoid further contamination or contact.
Inhalation	If inhaled, provide fresh air, warmth, rest and, if necessary, seek medical advice.
Skin contact	Clean areas of skin affected with soap and plenty of water and, if necessary, seek medical advice.
Eye contact	In case of contact with eyes, rinse immediately with plenty of water until irritation subsides. SEEK MEDICAL ADVICE.
Ingestion	Allow the patient to vomit on his own accord. Give copious water to drink and if necessary seek medical advice. Beware of aspiration if vomiting does occur.
Most important symptoms and effects, both acute and delayed	Irritation to eyes, skin, nose, headache, drowsiness, lassitude, narcosis; cough.
Indication of any immediate medical attention and special treatment needed	Obtain immediate medical assistance in case of massive inhalation, ingestion or eye contact.

SECTION 5. FIRE FIGHTING MEASURES

General hazard	THE PRODUCT IS A HIGHLY FLAMMABLE LIQUID
Extinguishing media	To suit local surroundings (e.g. water spray, carbon dioxide, foam, chemical powder)
Extinguishing media not to be used	Full water jet
Special hazards arising from the substance or mixture	Decomposition products released in a fire, (e.g. oxides of carbon), should be considered toxic if inhaled. The formation of explosive air/vapour mixtures is possible.
Advice for fire-fighters	Wear self-contained breathing apparatus and a chemical resistant suit. Cool endangered containers with water (to prevent container explosion).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Remove all sources of ignition - NO SMOKING! Adhere to personal protective measures. Ventilate area well after a release.
Environmental precautions	Do not allow to get into waste water or waterways; if this occurs, inform the relevant water authority at once.
Methods and materials for containment and cleaning up	Take up with absorbent material, e.g. sand, sawdust, using spark proof equipment, into tightly closable containers. Label container and dispose of as prescribed. For large spills, dike or dam to contain for disposal later. Contact emergency authorities.
Reference to other sections	Section 8 – personal protective measures. Section 13 – disposal of waste.

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling

Handle in accordance with good hygiene and safety practice.
Remove all sources of ignition - NO SMOKING!
Vapours may form explosive mixtures in air - earth electrical equipment.

Conditions for safe storage, including any incompatibilities

Ensure adequate ventilation of the storage area. Keep containers tightly closed, cool, dry and out of direct sunlight.
Store away from oxidising agents, peroxides, acids, acid chlorides, acid anhydrides, alkali metals, ammonia.

Specific end use(s)

Industrial and Professional: Consult Exposure Scenario/s 1 – 9, 17 and 18, as appropriate.
Consumer: Consult Exposure Scenarios 10 - 16, as appropriate.
ES1: Exposure Scenario for Industrial manufacturing of Ethanol, or use as intermediate or process chemical
ES2: Exposure Scenario for Industrial distribution of Ethanol
ES3: Exposure Scenario for Industrial formulation and (re)packing of Ethanol, and its mixtures
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ES14: Exposure Scenario for Consumer use of Ethanol in coatings and paints
ES15: Exposure Scenario for Consumer use of Ethanol in antifreeze, deicing and screenwash products
ES16: Exposure Scenario for Consumer use of Ethanol in washing and cleaning products
ES17: Exposure Scenario for Industrial and Professional use of Ethanol as laboratory agent
ES18: Exposure Scenario for Industrial and Professional use of Ethanol as heat transfer fluid, or other functional fluid

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Monitoring of the workplace should be considered in accordance with Community Exposure Limits (EH40 etc.) or other data as indicated below.

LTEL (8 hour TWA):	1000	ppm	1920	mg/m^3	WEL EH40 (2005)
STEL (15 min):	-	ppm	-	mg/m^3	WEL EH40 (2005)
TLV-STEL (15 min):	1000	ppm	-	mg/m^3	ACGIH 2009
LTEL (8 hour TWA):	-	ppm	1900	mg/m^3	DNEL acute, inhalation irritation, respiratory tract
LTEL (8 hour TWA):			343	mg/kg/day	DNEL long term, dermal repeated dose toxicity
LTEL (8 hour TWA):			950	mg/m^3	DNEL long term, inhalation carcinogenicity
Aqua (freshwater)			0.96	mg/l	PNEC (extrapolated)
Aqua (marine water):			0.79	mg/l	PNEC (extrapolated)

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Aqua (intermittent releases)	2.75	mg/l	PNEC (extrapolated)
Sediment (freshwater)	3.6	mg/kg	PNEC (extrapolated)

Engineering controls
Ensure adequate ventilation of working area.
Take measures against the build up of electrostatic charges.

Personal protection
Observe normal standards for handling chemicals.
Do not breathe vapour.
Wash hands before breaks and after work.
Wear personal protective equipment appropriate to the task (see below).

Eye protection
Tight fitting goggles.

Skin protection
PVC gloves. Protective suit.

Respiratory protection
Respirator or air fed visor (if ventilation is insufficient).

Other personal protection
Personal protective equipment should be selected as appropriate to the nature and aggressiveness of the identified hazard(s). It should be regularly inspected for such things as soundness against leaks, bad fitting and possible chemical penetration. Recommended safe user periods should never be exceeded.

Environmental exposure controls
Do not allow to get into waste water or waterways.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical form Liquid.

Colour Colourless

Odour Mild, pleasant.

Odour threshold 10 ppm (approx.)

Molecular weight 46.07

Molecular formula C_2H_5OH

pH Not applicable

Melting pt / range -114°C

Boiling pt / range 78.3°C

Flash point 13°C @ 101.3 kPa (closed cup)

Relative Evaporation Rate (n-Butyl Acetate = 1) 3.2 (Fast)

General Flammability HIGHLY FLAMMABLE

Flammability/explosive limits Lower Explosive Limit 3.3 %(v/v)

Vapour pressure 5.726 kPa @ 20°C

Vapour Density 1.03

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Relative Density	0.784 @ 25°C
Solubility	Miscible with water (789g/litre @ 20°C Miscible with ether and chloroform
Partition coefficient (log P or log K n-octanol / water)	-0.35 @ 20°C
Auto-ignition temperature	363°C @ 101.3 kPa
Decomposition temperature	Not available
Viscosity	1.2 mPa s @ 20°C
Explosive properties	Not applicable, based on structure.
Oxidising properties	Not applicable, based on structure.
Other information	None reported.

SECTION 10. STABILITY & REACTIVITY

Reactivity	May react with natural rubber, methylmethacrylate plastics, polyamides, zinc and brass.
Chemical stability	Stable under normal conditions of handling and storage.
Possibility of hazardous reactions	May react vigorously with oxidising agents and alkali metals.
Conditions to avoid	Heat and ignition sources, moisture.
Incompatible materials	Oxidising agents, peroxides, acids, acid chlorides, acid anhydrides, alkali metals, aluminium at high temperature, ammonia.
Hazardous decomposition products	Data not supplied

SECTION 11. TOXICOLOGICAL INFORMATION

Information on toxicological effects	Ethanol is highly soluble in both water and lipid, allowing absorption across the surface of the gastrointestinal (GI) tract, the lungs and skin. It can also be absorbed by inhalation. Routes of exposure: ingestion, inhalation, skin and eye contact Target organs: digestive system, liver, eyes, skin, respiratory system, central nervous system, blood, reproductive system.		
Acute toxicity - oral	LD_{50} rat (oral)	10470 mg/kg	OECD Guideline 401 (Acute Oral Toxicity)
Acute toxicity - inhalation	LC_{50} rat (inhalation)	51 mg/l/6H	Equivalent or similar to OECD Guideline 403 (Acute Inhalation Toxicity)
Acute toxicity - dermal	LD_{50} rabbit (skin)	>15800 mg/kg	Unreferenced
Skin corrosion/irritation	Not irritating.		
	Rabbit Coverage: occlusive (shaved)	Not irritating	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)

SECTION 11. TOXICOLOGICAL INFORMATION

Serious eye damage/irritation

Irritating to eyes

Rabbit	Category 2A (irritating to eyes)	OECD Guideline 405 (Acute Eye Irritation / Corrosion)

Respiratory sensitisation

There are data and no indicators for respiratory sensitisation

Skin sensitisation

Not sensitising.

Mouse, male Local lymph node assay	Not sensitising	Equivalent or similar to OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)

CMR effects

Carcinogenicity: data conclusive, not sufficient for classification.
Mutagenicity: data conclusive, not sufficient for classification.
Reproductive toxicity: data conclusive, not sufficient for classification.

Single dose toxicity

No data available.

Repeated dose toxicity

No Observed Adverse Effect Level, rat, oral: 1730mg/kg/day

Exposure - oral

Rat, male/female subchronic (oral: drinking water) 5% w/v in deionised water Exposure: 90 days	NOAEL: ca. 3250 mg/kg bw/day (nominal) (male) NOAEL: < 4400 mg/kg bw/day (nominal) (female)	Equivalent or similar to EPA OPPTS

Exposure - inhalation

Limited data for sub-acute studies available.

Exposure - dermal

There are no repeat dose toxicity data by the dermal route available

Aspiration hazard

Aspiration hazard if swallowed.

Adverse health effects and symptoms

Irritation eyes, skin, nose; headache, drowsiness, lassitude (weakness, exhaustion), narcosis; cough; liver damage; anaemia; reproductive, teratogenic effects.

Other information

None reported.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity

Ethanol undergoes degradation in air, soil and sediment.
The acute toxicity of ethanol to aquatic species is >100mg/l for all trophic levels.

Fish, acute	LC_{50} Oncorhynchus mykiss	11200 mg/l/24H	US EPA method E03-05:
Fish, chronic	No studies available		
Invertbrates	EC_{50} Ceriodaphnia dubia	5012 mg/l/48H	ASTM E729-80
Algae	EC_{50} Chlorella vulgaris	275 mg/l/72H	Equivalent or similar to OECD Guideline 201 (Alga, Growth Inhibition Test)
Soil organisms	LC_{50} Eisenia fetida (annelids)	> 0.1 — < 1 mg/cm^2/48H	Ref: Roberts, B.L., H.W. Dorough. (1984)
Micro-organisms	EC_{50} Paramaecium caudatum	5.8 g/l/4H	Ref: Rajini, P.S., Krishnakumari, M.K., Majumder, S.K. (1989)

Other organisms

Based on the use pattern for ethanol, and considering its ready biodegradability, direct and indirect exposure of birds is unlikely.

Persistence and degradability

Readily biodegradable.

SECTION 12. ECOLOGICAL INFORMATION

In air
Ethanol vapour is expected to undergo indirect photolysis through hydroxyl radical reaction at a slow to moderate rate, with an estimated half-life of 38 hours

Aquatic

Test type: ready biodegradability sewage, domestic, non-adapted	Readily biodegradable % Degradation of test substance: ca. 74 after 5 d ca. 74 after 10 d ca. 95 after 15 d ca. 84 after 20 d (O_2 consumption)

Terrestrial
Ethanol will be readily degraded in soil, with a predicted half-life in the range a few days.

Bioaccumulative potential
Based on its low partition co-efficient (log Kow), ethanol has a low potential for bioaccumulation
The BCF estimated from the partition coefficient is 3.2.

Mobility in soil
Ethanol is expected to have a low potential for adsorption, due to the low value of log Kow (<=3).

Results of PBT and vPvB assessment
Not classified, based on the assessment carried out according to Annex XIII of REACH regulation.

Other adverse effects
No significant potential for exposure for humans or predators via the environment.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Dispose of waste product in accordance with national (i.e. Hazardous Waste Regulations) and local authority regulations.
Avoid sources of ignition and use appropriate control measures (see Section 8)
Do not allow to get into waste water or waterways.
Use recovery/recycling where possible, otherwise incineration is the recommended method of disposal.
Caution - used containers may contain highly flammable vapour. Do not cut, weld, bore, burn or incinerate empty containers, unless they have been cleaned and declared safe. Do not incinerate closed containers.
Treat empty containers in the same way as the product or if possible wash out thoroughly and recycle.

SECTION 14. TRANSPORT INFORMATION

Land transport (ADR/RID)

UN number
1170

UN proper shipping name
ETHANOL

Transport hazard class(es)
3

Packing group
II

Environmental hazards
The product is not classified as environmentally hazardous.

Special provisions
274 to 330 – 601 – 640D

Emergency action code
2YE

Hazard Identification Number
33

SECTION 14. TRANSPORT INFORMATION

Marine transport (IMDG)

UN number	1170
UN proper shipping name	ETHANOL
Transport hazard class(es)	3
Packing group	II
Environmental hazards	The product is not classified as environmentally hazardous or a marine pollutant.
Special provisions	None reported

Air transport (ICAO/IATA)

UN number	1170
UN proper shipping name	ETHANOL
Transport hazard class(es)	3
Packing group	II
Environmental hazards	The product is not classified as environmentally hazardous.
Special provisions	None reported

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for product	Classification, Labelling and Packaging Regulation (EC) 1272/2008 Control of major accident hazards involving dangerous substances 96/82/E
Chemical Safety Assessment	A Chemical Safety Assessment has been carried out.

SECTION 16. OTHER INFORMATION

Date of revision	Not applicable
Reason for revision	Not applicable
Sections revised	Not applicable

Key to abbreviations and acronyms

67/548/EEC	EU Dangerous Substances Directive
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
ADR	European agreement governing the international carriage of dangerous goods by road
CAS No	Chemical Abstracts Service Registry Number
CLP	Classification, Labelling and Packaging Regulation (EC) 1272/2008
CMR	Carcinogen, Mutagen, Reprotoxin
DGEAC	Dangerous Goods Emergency Action Code List 2009
DNEL	Derived No Effect Level
EC_{50}	Half maximal effective concentration

SECTION 16. OTHER INFORMATION

EC No	European Inventory of Chemical Substances number
EH40 (2005)	HSE's list of Workplace Exposure Limits, as updated and amended
GHS	Globally Harmonised System for classification and labelling chemicals
GHS02	Pictogram – Flame
GHS07	Pictogram – Exclamation mark
HSE	Health and Safety Executive (UK)
kPa	kilopascal
LC_{50}	Concentration of a material in air that kills 50% of the test subjects
LD_{50}	Amount of a solid or liquid material that kills 50% of test subjects
LTEL	Long Term Exposure Limit
mg/m^3	milligrams per cubic metre
OECD	Organisation for Economic Co-operation Information and Development
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No Effect Concentration
ppm	Parts per million
REACH	Registration, Evaluation and Authorisation of Chemicals Regulation (EC) 1907/2006
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TWA	Time Weighted Average
vPvB	very Persistent, very Bioaccumulative
WEL	Workplace Exposure Limit

Sources of data REACH Registration Dossier, ADR, DGEAC, EH40, ACGIH.

Methods used to evaluate information used for classification Chemical Safety Report.

Key to Hazard Statements in Section 3

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

Key to Risk Phrases in Section 3

R11	Highly flammable

This information is based on our present state of knowledge and is intended to describe our products from the point of view of the safety requirements. It should not be construed as guaranteeing specific properties.

Data sheet prepared by Environmental Science Limited. EI4590 Printing date 16/02/2011

1. Exposure Scenario for Industrial manufacturing of Ethanol, or use as intermediate or process chemical

Ethanol REACH Association reference no. ES1

Systematic title based on use descriptor	SU3, SU8, SU9 PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b ERC1, ERC4, ERC6A
Processes, tasks, activities covered	Covers the industrial manufacture of Ethanol at controlled manufacturing plants in continuous and batch processes. Includes recycling/ recovery, material transfers, filling, storage, maintenance and loading, sampling and use as an intermediate or process chemical.
Assessment Method	Ecetoc TRA integrated model version 2, EUSES v.2.

1.1 Exposure Scenario

1.1.1. Operational conditions and risk management measures

Process categories: Continuous process in high integrity contained systems with little potential for exposure (sampling via closed loop system) and continuous process not specifically aimed at minimizing emissions. Occasional exposure possible through e.g. maintenance and sampling. Sampling, loading, filling, storage and transfer under controlled conditions at the manufacturing site is also included.

Environmental release categories: Manufacture, and industrial use as intermediate or process chemical of organic substances using continuous processes or batch processes applying dedicated or multi-purpose equipment, either technically controlled or operated by manual interventions.

Number of sites using the substance: Substance widely used.

1.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
Human factors not influenced by risk management	Potentially exposed body parts	Two hands face side only (automated processes/PROC1, 2) Two hands (transfer, filling, etc./PROC8a,b)
	Exposed skin surface	480 cm^2 (automated processes/PROC1, 2, 3,4) 960 cm^2 (transfer, filling, etc./PROC8a,b)
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Outdoor
Technical conditions and measures at process level (source) to prevent release	No specific technical prevention measures required for process in high integrity contained systems with little potential for exposure or with only occasional minor exposure through e.g. maintenance and sampling.	
Technical conditions and measures to control dispersion from source towards the worker	Ventilation	None required
	Efficiency rate	95 %
Organisational measures to prevent /limit releases, dispersion and exposure	Handle substances within a predominantly closed system. Ensure material transfers are under containment or extract ventilation. No specific organizational measures required for processes in high integrity contained systems with little potential for exposure or with only occasional minor exposure through e.g. maintenance and sampling.Provide extract ventilation to points where emissions occur. Wear suitable gloves tested to EN374 during the activities where skin contact is possible.	
Conditions and measures related to personal protection, hygiene and health evaluation	PPE: Respiratory Protection - not required for normal operations. PPE: Eye Protection – suitable eye protection should be worn when handling product if there is a risk of splashing .	

1.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid
	Concentration of substance in product	Up to 100 %
Amounts used	Daily at point source	n.a.
	Annually at point source	400,000 t/year (maximum plant size, worst case)
	Annually total	4,600,000 t/year total market

Frequency and duration of use	Pattern of release	Continuous 350 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoor and/or outdoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level (source) to prevent release	Keep containers tightly closed. Store in a bounded area. Do not discharge into sewers or drains. Use appropriate emission abatement equipment from LEV systems if required by local legislation. Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and national regulations	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Apply technical measures aiming at reducing releases to air (containment by preference or catalytic or thermal gas oxidation)	Efficacy >70% (for ethanol)
	Apply technical measures aiming at reduction and cleaning of waste water (WWTP /local STP (e.g. biological treatment))	Efficacy >87% (for ethanol)
Organizational measures to prevent/limit release from site	Do not release wastewater directly into environment	Wastewater release into local or municipal STP.
Conditions and measures related to municipal sewage treatment plant	Size of STP	>= 2000 m^3/day
	Degradation efficacy	90% (for ethanol)
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	Hazardous waste incineration or dispose for use in recycled fuels	

1.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2.. Below given exposure estimates are based on the PROC with the highest exposure levels in this scenario (PROC8a).

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	96.04	950 (OEL)	PROC 8a results in the highest exposure in this exposure scenario
Dermal (mg/kd/day)	13.71	343	
Combined (mg/kg/day)	27.43	343	

Environmental exposure estimation is calculated with EUSES 2.0 model. Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by 90% in the local and/or municipal STP under evaluated conditions.

Release times per year (day/year)	350	Local release to air (kg/day)	226.0
Fraction used at main local source	0.086	Local release to waste water (kg/day)	11.3
Amount used locally (kg/day)	0	Local release to soil (kg/day)	0

Environmental exposure	PEC	PNEC	Comment
In STP / untreated wastewater(mg/l)	5.65	580	-
In local freshwater (mg/l)	0,0000264	0,96	-
In local soil	0.00119 (mg/kg)	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,00000224	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2 and EUSES v2.0 respectively.
If the local environmental emission conditions deviate significantly from the used default values, please use the algorithm below to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Example for calculating your local freshwater PEC:
Corrected local freshwater PEC = 0,0000264* (your local emission [kg/day] / 350) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)

Additional good practice advice beyond the REACH CSA	
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

2. Exposure Scenario for Industrial distribution of Ethanol

Ethanol REACH Association reference no. ES2

Systematic title based on use descriptor	SU3, SU8, SU9 PROC8a, PROC8b, PROC9 ERC2
Processes, tasks, activities covered	Covers transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated and dedicated facilities, loading (including marine vessel/barge, rail/road car and IBC loading), storage, and repacking (including drums and small packs) of substance, including its distribution. Intended for e.g. traders, distributors, transporters, etc.
Assessment Method	Ecetoc TRA integrated model version 2

2.1 Exposure Scenario

2.1.1. Operational conditions and risk management measures

Process categories: Sampling, loading, filling, transfer, drumming, bagging in non-dedicated facilities. Exposure related to vapour, aerosols or spillage, and cleaning of equipment to be expected.

Environmental release category: Mixing, blending, diluting, transferring, filling, drumming and distributing activities of substances in all types of drumming, distribution and trading industry. Also includes drumming, filling and distribution activities in formulating industries, such as paints and do-it-yourself products, pigment pastes, fuels, household products (cleaning products), cosmetics, lubricants etc.

Number of sites using the substance: Substance widely used.

2.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
Human factors not influenced by risk management	Potentially exposed body parts	Two hands
	Exposed skin surface	960 cm^2
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Outdoor or in ventilated (open) spaces
Technical conditions and measures at process level (source) to prevent release	No specific technical prevention measures required	
Technical conditions and measures to control dispersion from source towards the worker	Outdoors	No specific measures identified.
	If indoors	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour). Ensure material transfers are under containment or extract ventilation. Provide good ventilation to points where emissions occur.
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified.	
Conditions and measures related to personal protection, hygiene and health evaluation	PPE: Eye Protection – suitable eye protection should be worn when handling product if there is a risk of splashing . Wear suitable gloves tested to EN374 during the activities where skin contact is possible.	

2.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid
	Concentration of substance in product	Up to 100 %
Amounts used	Daily at point source	n.a.
	Annually at point source	75,000 t/year (worst case scenario, at point source)

	Annually total	3,800,000 t/year total market
Frequency and duration of use	Pattern of release	300 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Outdoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level (source) to prevent release	Keep containers tightly closed. Store in a bounded area. Do not discharge into sewers or drains. Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and national regulations	
Organizational measures to prevent/limit release from site	Do not release wastewater directly into environment	Wastewater release into local or municipal STP.
Conditions and measures related to municipal sewage treatment plant	Size of STP	>2000 m^3/day
	Degradation efficacy	>90% (for ethanol)
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	Hazardous waste incineration or dispose for use in recycled fuels	

2.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2.. Below given exposure estimates are based on the PROC with the highest exposure levels in this scenario (PROC8a).

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	96.04	950 (OEL)	PROC 8a results in the highest exposure in this exposure scenario
Dermal (mg/kd/day)	13.71	343	
Combined (mg/kg/day)	27.43	343	

Environmental exposure estimation is based on Ecetoc TRA model v2 including the data from TGD A&B tables (MC-Ib, IC-2, UC-48, fraction main source 0,1) and based on the worst-case scenario with point-source production volume of 15,000 tpa.
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade for 90% in the local and/or municipal STP under evaluated conditions.

Release times per year (day/year)	300	Local release to air (kg/day)	50
Fraction used at main local source	0.1	Local release to waste water (kg/day)	15
Amount used locally (kg/day)	5000	Local release to soil (kg/day)	1

Environmental exposure	PEC	PNEC	Comment
In STP / untreated wastewater(mg/l)	4.66	580	-
In local freshwater (mg/l)	0,52	0,96	-
In local soil	0.007 (mg/kg)	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0515	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2 and EUSES v2.0 respectively.
If the local environmental emission conditions deviate significantly from the used default values, please use the algorithm below to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Example for calculating your local freshwater PEC:
Corrected freshwater PEC = 0,104 * (your local emission [kg/day] / 15) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)

Additional good practice advice beyond the REACH CSA	
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

3. Exposure Scenario for Industrial formulation and (re)packing of Ethanol, and its mixtures

Ethanol REACH Association reference no.	ES3
Systematic title based on use descriptor	SU3, SU10 PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14 ERC 2
Processes, tasks, activities covered	Covers industrial formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, large and small scale packing, maintenance. Includes formulation of fuels containing ethanol.
Assessment Method	Ecetoc TRA integrated model version 2, EUSES v.2.

3.1 Exposure Scenario

3.1.1. Operational conditions and risk management measures

Process category: Manufacture or formulation of chemical products or articles using technologies related to mixing and blending of solid or liquid materials, and where the process is in stages and provides the opportunity for significant contact at any stage. Filling lines specifically designed to both capture vapour and aerosol emissions and minimise spillage. Sampling, loading, filling, transfer, dumping, bagging in non-dedicated and dedicated facilities with possible exposure related to dust, vapour, aerosols or spillage, and cleaning of equipment.

Environmental release category: Manufacture of organic and inorganic substances in chemical, petrochemical, primary metals and minerals industry including intermediates, monomers using continuous processes or batch processes applying dedicated or multi-purpose equipment, either technically controlled or operated by manual interventions

Number of sites using the substance: Substance widely used.

3.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
Human factors not influenced by risk management	Potentially exposed body parts	Two hands face side only (automated processes/PROC3) Two hands (transfer, filling, etc./PROC8a,b)
	Exposed skin surface	480 cm^2 (automated processes/PROC3) 960 cm^2 (transfer, filling, etc./PROC8a,b)
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors
Technical conditions and measures at process level (source) to prevent release	No specific measures identified.	
Technical conditions and measures to control dispersion from source towards the worker	Ensure material transfers are under containment or extract ventilation. Provide good ventilation to points where emissions occur. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour).	
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified.	
Conditions and measures related to personal protection, hygiene and health evaluation	PPE: Eye Protection – suitable eye protection should be worn when handling product if there is a risk of splashing . Wear suitable gloves tested to EN374 during the activities where excessive skin contact is possible.	

3.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid

Amounts used	Concentration of substance in product	Up to 100 %
	Daily at point source	n.a.
	Annually at point source	280,000 t/year (maximum at point source in worst case)
	Annually total	3,800,000 t/year
Frequency and duration of use	Pattern of release	Continuous 300 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level (source) to prevent release	Keep containers tightly closed. Store in a bounded area. Do not discharge into sewers or drains. Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and national regulations. Formulation activity is assumed to be a predominantly enclosed process.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Apply technical measures aiming at reduction and cleaning of waste water (WWTP/local STP (e.g. biological treatment))	Efficacy >90%
Organizational measures to prevent/limit release from site	Do not release wastewater directly into environment	Wastewater release into municipal STP.
Conditions and measures related to municipal sewage treatment plant	Size of STP	>2000 m^3/day
	Degradation efficacy	90% (for ethanol)
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	Hazardous waste incineration or dispose for use in recycled fuels	

3.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2.. Below given exposure estimates are based on the PROC with the highest exposure levels in this scenario (PROC8a).

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	96.04	950	PROC 8a results in the highest exposure in this exposure scenario
Dermal (mg/kd/day)	13.71	343	
Combined (mg/kg/day)	27.43	343	

Environmental exposure estimation is based on Ecetoc TRA model v2 including the data from TGD A&B tables (MC-Ib, IC-9, UC-27, fraction main source 0,1) and based on the worst-case scenario.
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by 90% in the local and/or municipal STP under evaluated conditions.

Release times per year (day/year)	300	Local release to air (kg/day)	469
Fraction used at main local source	0.1	Local release to waste water (kg/day)	28
Amount used locally (kg/day)	93.333	Local release to soil (kg/day)	9

Environmental exposure	PEC	PNEC	Comment
In STP / untreated wastewater(mg/l)	1.73	580	-
In local freshwater (mg/l)	0,185	0,96	-
In local soil	0.0117 (mg/kg)	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0186	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2.
If the local environmental emission conditions deviate significantly from the used default values, please use the algorithm below to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Example for calculating your local freshwater PEC:
Corrected local freshwater PEC = 0,185 * (your local emission [kg/day] / 28) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	

4. Exposure Scenario for Industrial use of Ethanol in non-spray applications

Ethanol REACH Association reference no. ES4

Systematic title based on use descriptor	SU3 PROC10, PROC13 ERC4
Processes, tasks, activities covered	Covers industrial (end) use of ethanol as such or in preparations in non-spray application (e.g. as processing aid, cleaning agent, solvent or ingredient in coatings). Indoor roller application, brushing and treatment of surfaces, treatment of articles by dipping/ pouring/ immersing/ soaking, etc.
Assessment Method	Ecetoc TRA integrated model version 2

4.1 Exposure Scenario

4.1.1. Operational conditions and risk management measures

Process category: Low energy spreading of e.g. coatings. Including cleaning of surfaces. Substance can be inhaled as vapours, skin contact can occur through droplets, splashes, working with wipes and handling of treated surfaces. Immersion operations. Treatment of articles by dipping, pouring, immersing, soaking, washing out or washing in substances; including cold formation or resin type matrix. Includes handling of treated objects (e.g. after dying, plating,). Substance is applied to a surface by low energy techniques such as dipping the article into a bath or pouring a preparation onto a surface. Use of substances at small-scale laboratory (< 1 l or 1 kg). Covers also the use of the substance as fuel sources (including additives) where limited exposure to the product in its unburned form is expected.

Environmental release category: Industrial use of processing aids in a batch process, not becoming part of an article using dedicated or multi-purpose equipment, either technically controlled or operated by manual interventions. For example, solvents used in chemical reactions or the 'use' of solvents during the application of paints, lubricants in metal working fluids, anti-set off agents in polymer moulding/casting.

Number of sites using the substance: Substance widely used.

4.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
Human factors not influenced by risk management	Potentially exposed body parts	Two hands, face side only (PROC13) Two hands (PROC10)
	Exposed skin surface	480 cm^2 (PROC13) 960 cm^2 (PROC10)
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors and outdoors
Technical conditions and measures at process level (source) to prevent release	No specific measures identified.	
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour) when working indoors. Ensure material transfers are under containment or extract ventilation. Provide good ventilation to points where emissions occur.	
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified.	
Conditions and measures related to personal protection, hygiene and health evaluation	PPE: Eye Protection – suitable eye protection should be worn when handling product if there is a risk of splashing . Wear suitable gloves tested to EN374 during the activities where prolonged or frequent skin contact is possible.	

4.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid
	Concentration of substance in product	Up to 100 %

Amounts used	Daily at point source	n.a.
	Annually to the region	2,750 t/year (general)
	Annually total	27,500 t/year (general) total market
Frequency and duration of use	Pattern of release	300 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoors and outdoors
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level (source) to prevent release	Do not discharge into sewers or drains. Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and national regulations.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Apply technical measures aiming at reduction and cleaning of waste water (WWTP/local STP (e.g. biological treatment))	Efficacy >70%
Organizational measures to prevent/limit release from site	Do not release wastewater directly into environment	Wastewater release into municipal STP.
Conditions and measures related to municipal sewage treatment plant	Size of STP	>2000 m^3/day
	Degradation efficacy	90% (for ethanol)
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	Hazardous waste incineration or dispose for use in recycled fuels	

4.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2.. Below given exposure estimates are based on the PROC with the highest exposure levels in this scenario (PROC8a).

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	96.04	950	PROC 10 results in the highest exposure in this exposure scenario
Dermal (mg/kd/day)	27.43	343	
Combined (mg/kg/day)	41.15	343	

Environmental exposure estimation is based on Ecetoc TRA model v2 including the data from TGD A&B tables (MC-Ib, IC-14, UC-48, fraction main source 0,1 using local STP and MC-Ic, IC-9, UC-27 fraction main source 0,1 using local STP). Below values are those related to processes with the highest risk characterization ratio (related to industrial use of coatings, inks and adhesives). All other activities covered in this exposure scenario result in lower environmental exposure estimates.
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by 90% in the local and/or municipal STP under evaluated conditions.

Release times per year (day/year)	300	Local release to air (kg/day)	367
Fraction used at main local source	0.1	Local release to waste water (kg/day)	5
Amount used locally (kg/day)	458	Local release to soil (kg/day)	1

Environmental exposure	PEC	PNEC	Comment
In STP / untreated wastewater(mg/l)	0.285	580	-
In local freshwater (mg/l)	0,039	0,96	-
In local soil	0.0091 (mg/kg)	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0039	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Example for calculating your local freshwater PEC:
Corrected freshwater PEC = 0,039 * (your local emission [kg/day] / 5) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)

Additional good practice advice beyond the REACH CSA	
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

5. Exposure Scenario for Industrial use of Ethanol in spray applications

Ethanol REACH Association reference no. ES5

Systematic title based on use descriptor	SU3 PROC7 ERC4
Processes, tasks, activities covered	Covers industrial (end) use of ethanol as such or in preparations by spraying (e.g. as processing aid, cleaning agent, solvent or ingredient in coatings). Indoor painting, application of coatings, adhesives, polishes/cleaners, air-care products and other mixtures containing Ethanol by automated spraying techniques in factories or comparable industrial settings.
Assessment Method	Ecetoc TRA integrated model version 2

5.1 Exposure Scenario

5.1.1. Operational conditions and risk management measures

Process category: Industrial-spraying (air dispersive techniques). Substances can be inhaled as aerosols. The energy of the aerosol particles may require advanced exposure controls.

Environmental release category: Industrial use of processing aids in a batch process, not becoming part of an article using dedicated or multi-purpose equipment, either technically controlled or operated by manual interventions.

Number of sites using the substance: Substance widely used.

5.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	liquid
	Concentration of substance in product	Up to 25 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
Human factors not influenced by risk management	Potentially exposed body parts	Two hands and forearms
	Exposed skin surface	1500 cm^2
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors
Technical conditions and measures at process level (source) to prevent release	No specific measures identified.	
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour) when working indoors. Ensure material transfers are under containment or extract ventilation. Provide good ventilation to points where emissions occur.	
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified.	
Conditions and measures related to personal protection, hygiene and health evaluation	Avoid excessive and frequent skin contact as much as possible. Wear suitable gloves tested to EN374 during the activities where excessive or frequent skin contact is possible. Wear a respirator conforming to EN140 with Type A filter or better if vented booth with laminar flow is not available.	

5.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid
	Concentration of substance in product	Up to 25 %
Amounts used	Daily at point source	n.a.
	Annually to the region	2,750 t/year (maximum in worst case)
	Annually total	27,500 t/year total market
Frequency and duration of use	Pattern of release	Continuous 300 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)

Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoors and outdoors
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level (source) to prevent release	Do not discharge into sewers or drains. Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and national regulations.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Apply technical measures aiming at reduction and cleaning of waste water (WWTP/local STP (e.g. biological treatment))	Efficacy >70%
Organizational measures to prevent/limit release from site	Do not release wastewater directly into environment	Wastewater release into municipal STP.
Conditions and measures related to municipal sewage treatment plant	Size of STP	>2000 m^3/day
	Degradation efficacy	90% (for ethanol)
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	Hazardous waste incineration or dispose for use in recycled fuels	

5.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2..

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	480.21	950	Exposure estimates and RCRs given here are calculated for conditions without LEV (worst case scenario).
Dermal (mg/kd/day)	42.86	343	
Combined (mg/kg/day)	111.46	343	

Environmental exposure estimation is based on Ecetoc TRA model v2 including the data from TGD A&B tables (MC-Ib, IC-14, UC-48, fraction main source 0,1 using local STP). Below values are those related to processes with the highest risk characterization ratio (related to industrial use of coatings, inks and adhesives). All other activities covered in this exposure scenario result in lower environmental exposure estimates.
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by >90% in the Local and Municipal STP under evaluated conditions.

Release times per year (day/year)	300	Local release to air (kg/day)	367
Fraction used at main local source	0.1	Local release to waste water (kg/day)	5
Amount used locally (kg/day)	458	Local release to soil (kg/day)	1

Environmental exposure	PEC	PNEC	Comment
In STP / untreated wastewater(mg/l)	0.285	580	-
In local freshwater (mg/l)	0,039	0,96	-
In local soil	0.0091 (mg/kg)	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0039	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2.
If the local environmental emission conditions deviate significantly from the used default values, please use the below algorithm to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Example for calculating your local freshwater PEC:
Corrected freshwater PEC = 0,039 * (your local emission [kg/day] / 5) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)

Additional good practice advice beyond the REACH CSA	
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

6. Exposure Scenario for Industrial use of Ethanol as fuel source

Ethanol REACH Association reference no. ES6a

Systematic title based on use descriptor	SU3 PROC16 ERC7
Processes, tasks, activities covered	Use as fuel or fuel additive in industrial setting.
Assessment Method	Ecetoc TRA integrated model version 2

6.1 Exposure Scenario

6.1.1. Operational conditions and risk management measures

Process category: Covers the use of material as fuel sources (including additives) where limited exposure to the product in its un-burned form is expected. Does not cover exposure as a consequence of spillage or combustion.

Environmental release category: Industrial use of substances in closed systems. Use in closed equipment, such as the use of liquids in hydraulic systems, cooling liquids in refrigerators and lubricants in engines and di-electric fluids in electric transformers and oil in heat exchangers. No intended contact between functional fluids and products foreseen, and thus low emissions via waste water and waste air to be expected.

Number of sites using the substance: Substance widely used.

6.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
Human factors not influenced by risk management	Potentially exposed body parts	One hand, face side only
	Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors
Technical conditions and measures at process level (source) to prevent release	No specific measures identified.	
Technical conditions and measures to control dispersion from source towards the worker	No specific measures identified	
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified.	
Conditions and measures related to personal protection, hygiene and health evaluation	No specific PPE measures identified.	

6.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid
	Concentration of substance in product	Up to 100 %
Amounts used	Daily at point source	n.a.
	Annually to the region	30,000 t/year (maximum in worst case)
	Annually total	300,000 t/year total market
Frequency and duration of use	Pattern of release	Continuous 300 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoors and outdoors
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level (source) to prevent release	Do not discharge into sewers or drains. Waste product and empty containers should be disposed of as hazardous waste in accordance with all local and national regulations.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Apply technical measures aiming at reduction and	Efficacy >70%

	cleaning of waste water (WWTP/local STP (e.g. biological treatment))	
Organizational measures to prevent/limit release from site	Do not release wastewater directly into environment	Wastewater release into municipal STP.
Conditions and measures related to municipal sewage treatment plant	Size of STP	>2000 m^3/day
	Degradation efficacy	90%
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	Hazardous waste incineration or dispose for use in recycled fuels	

6.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2..

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	9.6	950	-
Dermal (mg/kd/day)	0.3	343	
Combined (mg/kg/day)	1.7	343	

Environmental exposure estimation is based on Ecetoc TRA model v2 including the data from TGD A&B tables (MC-Ic, IC-9, UC-27, fraction main source 0,02 using local STP, 350 emission days per year).
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by 90% in the STP under evaluated conditions.

Release times per year (day/year)	350	Local release to air (kg/day)	9
Fraction used at main local source	0.02	Local release to waste water (kg/day)	1
Amount used locally (kg/day)	1714	Local release to soil (kg/day)	2

Environmental exposure	PEC	PNEC	Comment
In STP / untreated wastewater(mg/l)	0.053	580	-
In local freshwater (mg/l)	0,0152	0,96	-
In local soil	0.0006 (mg/kg)	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0016	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2.
If the local environmental emission conditions deviate significantly from the used default values, please use the algorithm below to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Example for calculating your local freshwater PEC:
Corrected freshwater PEC = 0,0152 * (your local emission [kg/day] / 5) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)

Additional good practice advice beyond the REACH CSA	
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

7. Exposure Scenario for Professional use of Ethanol as fuel source

Ethanol REACH Association reference no. ES6b

Systematic title based on use descriptor	SU22 PROC16 ERC 9a, ERC 9b
Processes, tasks, activities covered	Use as fuel or fuel additive in professional setting.
Assessment Method	Ecetoc TRA integrated model version 2

7.1 Exposure Scenario

7.1.1. Operational conditions and risk management measures

Process category: Covers the use of material as fuel sources (including additives) where limited exposure to the product in its unburned form is expected. Does not cover exposure as a consequence of spillage or combustion.

Environmental release category: Professional use of substances in closed systems. Use in closed equipment, such as the use of liquids in hydraulic systems, cooling liquids in refrigerators and lubricants in engines and dielectric fluids in electric transformers and oil in heat exchangers. No intended contact between functional fluids and products foreseen, and thus low emissions via waste water and waste air to be expected.

Number of sites using the substance: Substance widely used.

7.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
Human factors not influenced by risk management	Potentially exposed body parts	One hand, face side only
	Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors
Technical conditions and measures at process level (source) to prevent release	No specific measures identified.	
Technical conditions and measures to control dispersion from source towards the worker	No specific measures identified	
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified.	
Conditions and measures related to personal protection, hygiene and health evaluation	No specific PPE measures identified.	

7.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid
	Concentration of substance in product	Up to 100 %
Amounts used	Daily at point source	n.a.
	Annually to the region	380,000 t/year
	Annually total	3,800,000 t/year total market for industrial, professional and consumer use
Frequency and duration of use	Pattern of release	Continuous wide dispersive: 365 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoors and outdoors
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level	Do not discharge into sewers or drains.	

(source) to prevent release		
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Do not discharge directly into environment. Use in predominantly enclosed systems	
Organizational measures to prevent/limit release from site	Do not release wastewater directly into environment	Wastewater release into municipal STP.
Conditions and measures related to municipal sewage treatment plant	Size of STP	>2000 m^3/day
	Degradation efficacy	90%
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	Hazardous waste incineration or dispose for use in recycled fuels	

7.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2..

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	9.6	950	-
Dermal (mg/kd/day)	0.3	343	
Combined (mg/kg/day)	1.7	343	

Environmental exposure estimation is based on Ecetoc TRA model ERC9a, and TGD-A&B table (MC-IV, IC-6, UC-27). Below values are those related to TGD A&B table calculation.
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by 90% in the STP under evaluated conditions.

Release times per year (day/year)	365	Local release to air (kg/day)	n.a. wide dispersive
Fraction used at main local source	0,002	Local release to sewage (kg/day)	n.a. wide dispersive
Amount used locally (kg/day)	2082	Local release to soil (kg/day)	n.a. wide dispersive

Environmental exposure	PEC	PNEC	Comment
In STP (mg/l)	0,065	580	-
In local freshwater (mg/l)	0,0240	0,96	-
In local soil (mg/kg)	0,0273	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0034	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2.
If the local environmental emission conditions deviate significantly from the used default values, please use the algorithm below to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Example for calculating your local freshwater PEC:
Corrected freshwater PEC = 0,0240 * (your local emission [kg/day] / 5) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

8. Exposure Scenario for Professional use of Ethanol in non-spray applications

Ethanol REACH Association reference no. ES7

Systematic title based on use descriptor	SU22 PROC10, PROC13, PROC14, PROC19 ERC8a, ERC8d
Processes, tasks, activities covered	Covers professional (end) use of ethanol as such or in preparations in non-spray application (e.g. as processing aid, cleaning agent, application of coatings). Indoor roller application, brushing and treatment of surfaces. Treatment of articles by dipping and pouring. Includes stabilization of explosives.
Assessment Method	Ecetoc TRA integrated model version 2

8.1 Exposure Scenario

8.1.1. Operational conditions and risk management measures

Process category: Low energy spreading of e.g. coatings. Including cleaning of surfaces. Substance can be inhaled as vapours, skin contact can occur through droplets, splashes, working with wipes and handling of treated surfaces. Immersion operations. Treatment of articles by dipping, pouring, immersing, soaking, washing out or washing in substances; including cold formation or resin type matrix. Includes handling of treated objects (e.g. after dying, plating,). Substance is applied to a surface by low energy techniques such as dipping the article into a bath or pouring a preparation onto a surface. Use of substances at small-scale laboratory (< 1 l or 1 kg). Addresses also occupations and activities where intimate and intentional contact with substances occurs without any specific exposure controls other than PPE.

Environmental release category: Wide dispersive indoor use of processing aids by the public at large or professional use. Use (usually) results in direct release into the sewage system, for example, cosmetics, detergents in fabric washing, machine wash liquids and lavatory cleaners, automotive and bicycle care products (polishes, lubricants, de-icers), solvents in paints and adhesives or fragrances and aerosol propellants in air fresheners.

Number of sites using the substance: Substance widely used.

8.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
Human factors not influenced by risk management	Potentially exposed body parts	Two hands, face side only (PROC13, 14) Two hands (PROC10) Two hands and forearms (PROC19
	Exposed skin surface	480 cm^2 (PROC13, 14) 960 cm^2 (PROC10) 1980 cm^2 (PROC19)
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors and outdoors
Technical conditions and measures at process level (source) to prevent release	If >4 hours/day (PROC19)	Limit the substance concentration in the product to 25%
Technical conditions and measures to control dispersion from source towards the worker	Provide a good standard of general or controlled ventilation. Natural ventilation is from windows and doors etc. Controlled ventilation means air is supplied or removed by a powered fan.	
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified.	
Conditions and measures related to personal protection, hygiene and health evaluation	If PROC 19 and concentration >25%	PPE: Wear suitable gloves tested to EN374 and avoid skin contact PPE: Eye Protection – suitable eye protection should be worn when handling product if there is a risk of splashing .

8.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid
	Concentration of substance in product	Up to 100 %
Amounts used	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use)
	Annually total	10,000 t/year total market
Frequency and duration of use	Pattern of release	Continuous 365 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoors and outdoors
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level (source) to prevent release	No specific measures identified.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	No specific measures identified.	
Organizational measures to prevent/limit release from site	Do not release wastewater directly into environment. Wastewater release into municipal STP.	
Conditions and measures related to municipal sewage treatment plant	Size of STP	>2000 m^3/day
	Degradation efficacy	90% (for ethanol)
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

8.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2. Below given exposure estimates are based on the PROC with the highest exposure levels in this scenario (PROC19).

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	115,25	950	PROC 19 results in the highest exposure in this exposure scenario
Dermal (mg/kd/day)	84,86	343	
Combined (mg/kg/day)	101,32	343	

Environmental exposure estimation is based on Ecetoc TRA model v2 based on ERC 8 a, d and TGD A&B table (MC-Ic, IC-6, UC-9). Below values are estimates based on the ERC approach calculation resulting in more conservative values.
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by 90% in the STP under evaluated conditions.

Release times per year (day/year)	365	Local release to air (kg/day)	5
Fraction used at main local source	0.1	Local release to waste water (kg/day)	5
Amount used locally (kg/day)	5.5	Local release to soil (kg/day)	1

Environmental exposure	PEC	PNEC	Comment
In STP / untreated wastewater(mg/l)	0.34	580	-
In local freshwater (mg/l)	0,045	0,96	-
In local soil	0.0003 (mg/kg)	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0044	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2.
If the local environmental emission conditions deviate significantly from the used default values, please use the algorithm below to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fr action) * (local STP efficiency fraction)
Example for calculating your local freshwater PEC:
Orrected local freshwater PEC = 0,045 * (your local emission [kg/day] / 5) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)

Additional good practice advice beyond the REACH CSA	
Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

9. Exposure Scenario for Professional use of Ethanol in spray applications

Ethanol REACH Association reference no. ES8

Systematic title based on use descriptor	SU22 PROC11 ERC8a, ERC8d
Processes, tasks, activities covered	Professional application of paints, coatings, adhesives, cleaners and other mixtures containing ethanol by spraying. Non industrial / professional spraying of mixtures and products like paints, coatings, adhesives, polishes, cleaners, etc.
Assessment Method	Ecetoc TRA integrated model version 2

9.1 Exposure Scenario

9.1.1. Operational conditions and risk management measures

Process category: Air dispersive techniques. Spraying for surface coating, adhesives, polishes/cleaners, air care products, sandblasting.
Substances can be inhaled as aerosols. The energy of the aerosol particles may require advanced exposure controls;

Environmental release category: Wide dispersive indoor and outdoor use of processing aids by the public at large or professional use. Use (usually) results in direct release into the sewage system, for example, cosmetics, detergents in fabric washing, machine wash liquids and lavatory cleaners, automotive and bicycle care products (polishes, lubricants, de-icers), solvents in paints and adhesives or fragrances and aerosol propellants in air fresheners.

Number of sites using the substance: Substance widely used.

9.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	Liquid (spray aerosol)
	Concentration of substance in product	5-25 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	300 Days/year
	Duration of exposure	Variable
Human factors not influenced by risk management	Potentially exposed body parts	Two hands and forearms
	Potentially exposed skin surface	1500 cm^2
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors and/or outdoors
Technical conditions and measures at process level (source) to prevent release	If duration of exposure > 4 hours/day	Limit the substance content in the product to 5%
	If duration of exposure 1-4 hours/day	Limit the substance content in the product to 25%
	If duration of exposure < 1 hours/day	No specific measures identified
Technical conditions and measures to control dispersion from source towards the worker	Substance content in the product > 25%	Provide enhanced general ventilation by mechanical means. Provide a good standard of general or controlled ventilation (5 to 15 air changes per hour)
	Substance content in the product 5 - 25%	Provide a good standard of general ventilation. Natural ventilation is from windows and doors etc. Controlled ventilation means air is supplied or removed by a powered fan.
	Substance content in the product < 5%	No specific measures identified.
Organisational measures to prevent /limit releases, dispersion and exposure	Do not carry out operation for more than 1 hour when substance content in the product exceeds 25% and no enhanced mechanical ventilation (minimum efficiency 70%) is available.	
Conditions and measures related to personal protection, hygiene and health evaluation	PPE: Respiratory Protection with at least 90% reduction in inhaled concentration of the substance	Condition: If no enhanced ventilation available and concentration of the substance in the product > 25 %

	PPE: Wear suitable gloves (chemically resistant gloves tested to EN374) during the activities where excessive skin contact is possible.	Condition: If concentration of the substance in the product > 5 %

9.1.3 Control of environmental exposure

Product characteristics	Physical state	Liquid (sprayed)
	Concentration of substance in product	5 - 25 %
Amounts used	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use)
	Annually total	10,000 t/year total market
Frequency and duration of use	Pattern of release	Continuous 365 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoors and outdoors
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level (source) to prevent release	No specific measures identified.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	No specific measures identified.	
Organizational measures to prevent/limit release from site	Do not release wastewater directly into environment. Wastewater release into municipal STP.	
Conditions and measures related to municipal sewage treatment plant	Size of STP	>2000 m^3/day
	Degradation efficacy	90%
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

9.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2. Below given exposure estimates are based on the PROC with the highest exposure levels in this scenario (PROC19).

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	672,29	950	-
Dermal (mg/kd/day)	21,43	343	
Combined (mg/kg/day)	117,47	343	

Environmental exposure estimation is based on Ecetoc TRA model v2 based on ERC8a default settings and TGD A&B table (MC-Ic, IC-6, UC-9). Below values are estimates based on the ERC approach calculation resulting in more conservative values.
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by 90% in the STP under evaluated conditions.

Release times per year (day/year)	365	Local release to air (kg/day)	n.a. wide dispersive
Fraction used at main local source	0.1	Local release to waste water (kg/day)	n.a. wide dispersive
Amount used locally (kg/day)	5.5	Local release to soil (kg/day)	n.a. wide dispersive

Environmental exposure	PEC	PNEC	Comment
In STP / untreated wastewater(mg/l)	0.34	580	-
In local freshwater (mg/l)	0,045	0,96	-
In local soil	0.0003 (mg/kg)	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0044	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2.
If the local environmental emission conditions deviate significantly from the used default values, please use the algorithm below to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Example for calculating your local freshwater PEC:
Corrected local freshwater PEC = 0,045 * (your local emission [kg/day] / 5) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	

10. Exposure Scenario for Consumer use of Ethanol as automotive fuel

Ethanol REACH Association reference no. ES9a

Systematic title based on use descriptor	SU21 PC13 ERC9a, ERC9b
Processes, tasks, activities covered	Covers the consumer use of automotive fuels which contain Ethanol
Assessment Method	Ecetoc TRA integrated model version 2, ConsExpo v 4.1

10.1 Exposure Scenario

10.1.1. Operational conditions and risk management measures

Product categories: Use of ethanol as automotive (vehicle) fuel. Minor exposure to ethanol vapours is possible during filling at the filling stations or transfer from portable fuel cans. Exposure to ethanol during the actual use of fuel (running of the engine) is not expected under normally foreseeable conditions of use since the substance is combusted in the (enclosed) engine system.

Environmental release category: Wide dispersive outdoor use by the public. Use (usually) results in minor direct release into environment through accidental spillage and evaporation during the filling.

Number of sites using the substance: Substance widely used.

10.1.2 Control of consumer exposure

Substance content in the product	Can be > 25 %
Amounts of product used / applied per event	Up to 100 litre
Exposure/release fraction	0,001 (Only to vapour and minor spills during the filling of the tank)
Frequency and duration of use/exposure	Frequency of exposure: weekly
	Duration of exposure per event: < 5 minutes (only during the filling of the tank)
Setting and external conditions during use	Outdoors
Technical (product related) use conditions	No specific measures required.
Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer; e.g. product labelling)	No specific measures required.

10.1.3 Control of environmental exposure

Product characteristics	Physical state	Liquid
	Concentration of substance in product	Can be > 25 %
Amounts used	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use)
	Annually total	3,800,000 t/year total market for industrial, professional and consumer use
Frequency and duration of use	Pattern of release	365 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Outdoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Conditions and measures related to municipal sewage treatment plant	No release into the wastewaters or sewage is expected from this use. Only environmental release form the consumer use of ethanol as fuel is evaporation during filling (<0,01 %, assuming that less than 10 gram of ethanol evaporates during the filling of 75 litre tank during 2-5 minutes).	
Conditions and measures related to disposal of waste resulting from the use of the products	No waste expected from this use.	
Conditions and measures related to recovery of waste resulting from the use	n.a.	

10.2. Exposure estimation

Consumer exposure estimation provided below is only indicative for one particular PC. The estimates are calculated with the industry model (draft version MasterCSA_8April2010) CSA (PC13, Automotive, refuelling at 100% concentration).

Consumer exposure	Exposure estimate	DNEL	Comment
Dermal (mg/kg/day)	35,00	LTS 206	-
Oral (mg/kg/day)	0,00	LTS 87	-
Inhalation (mg/m3 for 24hr day)	1,54	LTS 144	-
All routes systemic	-	-	-
Environmental exposure estimation is based on Ecetoc TRA model v2 based on ERC8d customized settings and total use of 3,800,000 tpa.			
Release times per year (day/year)	365	Local release to air (kg/day)	n.a. wide dispersive
Fraction used at main local source	0.002	Local release to waste water (kg/day)	n.a. wide dispersive
Amount used locally (kg/day)	n.a	Local release to soil (kg/day)	n.a. wide dispersive

Environmental exposure	PEC	PNEC	Comment
In STP (mg/l)	0,065	580	-
In local freshwater (mg/l)	0,0240	0,96	-
In local soil (mg/kg)	0,0273	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0034	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

11. Exposure Scenario for Consumer use of Ethanol as domestic fuel

Ethanol REACH Association reference no. ES9b

Systematic title based on use descriptor	SU21 PC13 ERC8a, ERC8d
Processes, tasks, activities covered	Covers the consumer use of domestic fuel products which contain Ethanol, e.g. ethanol fuel burners, fondue sets, heaters, etc. Includes garden equipment refuelling.
Assessment Method	Ecetoc TRA integrated model version 2, ConsExpo v 4.1

11.1 Exposure Scenario

11.1.1. Operational conditions and risk management measures

Product categories: Fuels (for domestic use) like ethanol liquid/gel filling for fireplaces, fondue sets, heaters, etc. During use, minor exposure is possible during the transfer of the liquid product from the can/packaging into the holder or (burning-) device. No exposure to ethanol is expected during the actual burning of the fuel since the ethanol vapours are fully combusted.

Environmental release category: Wide dispersive indoor and outdoor use by public at large. Use (usually) results in direct release into the sewage system or environment. In this use, as domestic fuel, only expected environmental release is through evaporation during filling of the device.

Number of sites using the substance: Substance widely used.

11.1.2 Control of consumer exposure

Substance content in the product	> 25 %
Amounts of product used / applied per event	Up to 1 litre
Potentially exposed body parts	Inside one hand: 210 cm^2
Frequency and duration of use/exposure	Frequency of use: weekly
	Duration of use: 5 minutes (Only during the filling of the device)
Setting and external conditions during use	Indoors and/or outdoors
Technical (product related) use conditions	No specific measures required.
Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer)	PPE: Eye Protection – suitable eye protection should be worn when handling product if there is a risk of splashing .

11.1.3 Control of environmental exposure

Product characteristics	Physical state	Liquid
	Concentration of substance in product	Can be > 25 %
Amounts used	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use)
	Annually total	10,000 t/year total market
Frequency and duration of use	Pattern of release	365 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoor and/or outdoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Conditions and measures related to municipal sewage treatment plant	No release into the wastewaters or sewage is expected from this use. Only environmental release form the consumer use of ethanol as domestic fuel is evaporation during filling of the burner device.	
Conditions and measures related to disposal of waste resulting from the use of the products	No waste expected from this use.	
Conditions and measures related to recovery of waste resulting from the use	n.a.	

11.2. Exposure estimation

Consumer exposure estimation provided below is only indicative for one particular PC. The estimates are calculated with the industry model (draft version MasterCSA_8April2010) CSA (PC13, Garden equipment-liquid-refuelling at concentration 100%).

Consumer exposure	Exposure estimate	DNEL	Comment

Dermal (mg/kg/day)	70,00	LTS 206	-
Oral (mg/kg/day)	0,00	LTS 87	-
Inhalation (mg/m3 for 24hr day)	0,81	LTS 144	-
All routes systemic	-	-	-
Environmental exposure estimation is based on Ecetoc TRA model v2 based on ERC8a and d settings and total use of 10.000 tpa. Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by >90% in the STP under evaluated conditions.			
Release times per year (day/year)	365	Local release to air (kg/day)	n.a. wide dispersive
Fraction used at main local source	0,002	Local release to waste water (kg/day)	n.a. wide dispersive
Amount used locally (kg/day)	n.a.	Local release to soil (kg/day)	n.a. wide dispersive

Environmental exposure	PEC	PNEC	Comment
In STP (mg/l)	0,340	580	-
In local freshwater (mg/l)	0,0447	0,96	-
In local soil (mg/kg)	0,0003	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0044	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

12. Exposure Scenario for Consumer use of Ethanol in products (<50g per event)

Ethanol REACH Association reference no. ES9c

Systematic title based on use descriptor	SU21 PC: 1, 3, 8, 12, 14, 15, 18, 23, 24, 27, 28, 30, 31, 34, 39 ERC8a, ERC8d
Processes, tasks, activities covered	Covers the consumer use of products which contain Ethanol with amount applied in use of less than 50g per event
Assessment Method	Ecetoc TRA integrated model version 2, ConsExpo v 4.1

12.1 Exposure Scenario

12.1.1. Operational conditions and risk management measures

Product categories: Adhesives (other than carpet and floor glue), sealants; Air care products; Artists supply and hobby preparations; Building and construction preparations; Metal-surface treatment products; Non-metal-surface treatment products; Ink and toners; Lawn and garden preparations; Leather tanning, finishing, impregnation, dye and care products; Lubricants, greases and release products; Plant protection products; Cosmetics and toiletries; Perfumes and fragrances; Photo-chemicals; Polishes and wax blends; Textile dye, finishing and impregnation products.

Environmental release category: Wide dispersive indoor and outdoor use. Use (usually) results in direct release into the sewage system or environment.

Number of sites using the substance: Substance widely used.

12.1.2 Control of consumer exposure

Substance content in the product	< 1 %	1 – 5 %	5 – 25 %	> 25 %
Product characteristic (including package design affecting exposure)	PC24, PC31	PC5, PC10, PC22, PC23, PC27, PC30, PC34	PC1, PC8, PC14, PC15, PC18,	PC3, PC28
Amounts of product used / applied per event	< 50 g	< 50 g	< 50 g	< 10 g
Frequency and duration of use/exposure	Frequency of use: Up to daily			
	Duration of use/application: up to 4 hours			
Setting and external conditions during use	Indoors (minimum room volume 20m^3) or outdoors			
Technical (product related) use conditions	n.a.	n.a.	n.a.	Controlled spray or release device.
Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer; e.g. product labelling)	No specific measures required.	No specific measures required.	No specific measures required.	Do not spray empty in small, enclosed areas. Avoid inhalation and skin contact.

12.1.3 Control of environmental exposure

Product characteristics	Physical state	Liquid
	Concentration of substance in product	Could be > 25 %
Amounts used	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use)
	Annually total	10,000 t/year total market, excluding cosmetics and toiletries
Frequency and duration of use	Pattern of release	365 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Conditions and measures related to municipal sewage treatment plant	Size of STP	> 2000 m^3/day
	Degradation efficacy	90%
	Sludge treatment (disposal or recovery)	Disposal or recovery
Conditions and measures related to disposal of waste resulting from the use of the products	No specific measures required.	

Conditions and measures related to recovery of waste resulting from the use	No specific measures required.

12.2. Exposure estimation

Consumer exposure estimation provided below is only indicative for one particular PC. The estimates are calculated with the industry model (draft version MasterCSA_8April2010) CSA (PC31 Polishes and wax blends for floor, furniture, shoes).

Consumer exposure	Exposure estimate	DNEL	Comment
Dermal (mg/kg/day)	2,87	LTS 206	-
Oral (mg/kg/day)	0,00	LTS 87	-
Inhalation (mg/m3 for 24hr day)	10,31	LTS 144	-
All routes systemic	-	-	-

Environmental exposure estimation is based on Ecetoc TRA model v2 based on ERC8a and ERC8d default settings. Below presented estimates are based on ERC8d with total use of 10,000 tpa. This volume excludes cosmetics and toiletries use, where a 200,000 tpa total market is assumed – all emissions from this sector are assumed to be emissions to air.
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to be degraded for >90% in the STP under evaluated conditions.

Release times per year (day/year)	365	Local release to air (kg/day)	n.a. wide dispersive
Fraction used at main local source	0,002	Local release to waste water (kg/day)	n.a. wide dispersive
Amount used locally (kg/day)	n.a.	Local release to soil (kg/day)	n.a. wide dispersive

Environmental exposure	PEC	PNEC	Comment
In STP (mg/l)	0,340	580	-
In local freshwater (mg/l)	0,0447	0,96	-
In local soil (mg/kg)	0,0003	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0044	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

13. Exposure Scenario for Consumer use of Ethanol in enclosed systems

Ethanol REACH Association reference no. ES9d

Systematic title based on use descriptor	SU21 PC16 (Heat transfer fluids), PC17 (Hydraulic fluids) ERC9a, ERC9b
Processes, tasks, activities covered	Covers the consumer use of products which contain Ethanol - products in enclosed systems (with no expected exposure to ethanol during use)
Assessment Method	Ecetoc TRA integrated model version 2, ConsExpo v 4.1

13.1 Exposure Scenario

13.1.1. Operational conditions and risk management measures

Product categories: Heat transfer fluids; Hydraulic fluids and other products where ethanol is part of the enclosed system and no exposure of consumers during the use of the product is expected under normal and reasonably foreseeable conditions of use.

Environmental release category: Indoor and outdoor use of substances by the public at large in closed systems. Use in closed equipment, such as the use of cooling liquids in refrigerators, oil-based electric heaters, hydraulic liquids in automotive suspension, lubricants in motor oil and brake fluids in automotive brake systems.

Number of sites using the substance: Substance widely used.

13.1.2 Control of consumer exposure

Substance content in the product	> 25 %
Product characteristic (including package design affecting exposure)	Substance is enclosed in the system and there is no consumer exposure possible under normal and reasonably foreseeable conditions of use.
Amounts of product used / applied per event	n.a. substance in enclosed system
Frequency and duration of use/exposure	Frequency of use: 1-5 times per year
	Duration per use: divers
Setting and external conditions during use	n.a. substance in enclosed system
Technical (product related) use conditions	n.a. substance in enclosed system
Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer; e.g. product labelling)	Do not open, break or dismantle the container during use. Do not open, break or dismantle the container before disposal. Dispose off as chemical waste. PPE: Eye Protection – suitable eye protection should be worn when handling product if there is a risk of splashing .

13.1.3 Control of environmental exposure

Product characteristics	Physical state	Liquid
	Concentration of substance in product	Can be > 25 %
Amounts used	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use in closed systems)
	Annually total	10,000 t/year total market
Frequency and duration of use	Pattern of release	365 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Conditions and measures related to municipal sewage treatment plant	No release into the wastewaters or sewage is expected from this use. Substance is used in enclosed system during its service life.	
Conditions and measures related to disposal of waste resulting from the use of the products	No waste expected from this use.	
Conditions and measures related to recovery of waste resulting from the use	n.a.	

13.2. Exposure estimation

Consumer exposure estimation provided below is only indicative for one particular PC. The estimates are calculated with the industry model (draft version MasterCSA_8April2010)) CSA (Heat transfer fluid category).

Consumer exposure	Exposure estimate	DNEL	Comment
Dermal (mg/kg/day)	0,85	LTS 206	-
Oral (mg/kg/day)	0,00	LTS 87	-

Inhalation (mg/m3 for 24hr day)	0,04	LTS 144	-
All routes systemic	-	-	-
Environmental exposure estimation is based on Ecetoc TRA model v2 based on ERC9a and b default settings and total use of 10.000 tpa. Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by >90% in the STP under evaluated conditions.			
Release times per year (day/year)	365	Local release to air (kg/day)	n.a. wide dispersive
Fraction used at main local source	0,002	Local release to waste water (kg/day)	n.a. wide dispersive
Amount used locally (kg/day)	n.a.	Local release to soil (kg/day)	n.a. wide dispersive

Environmental exposure	PEC	PNEC	Comment
In STP (mg/l)	0,017	580	-
In local freshwater (mg/l)	0,0155	0,96	-
In local soil (mg/kg)	0,00013	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,00145	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

14. Exposure Scenario for Consumer use of Ethanol in coatings and paints

Ethanol REACH Association reference no. ES9e

Systematic title based on use descriptor	SU21 PC9a, PC9c ERC8a, ERC8d
Processes, tasks, activities covered	Covers the consumer use of coatings and paint products which contain Ethanol.
Assessment Method	Ecetoc TRA integrated model version 2, ConsExpo v 4.1

14.1 Exposure Scenario

14.1.1. Operational conditions and risk management measures

Product categories: Coatings, paints, thinners and paint removers. Exposure to ethanol is possible during mixing, pouring and application (roller, brushing and spraying) of the products.

Environmental release category: Wide dispersive indoor and outdoor use of processing aids by the public at large. Use (usually) results in direct release into the sewage system or into environment.

Number of sites using the substance: Substance widely used.

14.1.2 Control of consumer exposure

Substance content in the product	1 – 15 %
Amounts of product used / applied per event	50 – 250 gram
Exposed skin area	428 cm^2 (Inside hands or one hand)
Frequency and duration of use/exposure	Frequency of exposure: 1 – 5 times per year
	Duration of exposure: 20 – 60 minutes
Setting and external conditions during use	Indoors (room volume minimum 20 m^3) Outdoors
Technical (product related) use conditions	Limit the ethanol content in the product to 15%.
Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer; e.g. product labelling)	Do not use in small, closed and not ventilated areas. Keep the doors and windows open during use indoors.

14.1.3 Control of environmental exposure

Product characteristics	Physical state	Liquid
	Concentration of substance in product	1 - 15 %
Amounts used	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use)
	Annually total	10,000 t/year total market
Frequency and duration of use	Pattern of release	365 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoor and/or outdoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Conditions and measures related to municipal sewage treatment plant	Size of STP	> 2000 m^3/day
	Degradation efficacy	90%
	Sludge treatment (disposal or recovery)	Disposal or recovery
Conditions and measures related to disposal of waste resulting from the use of the products	No specific measures required.	

14.2. Exposure estimation

Consumer exposure estimation provided below is only indicative for one particular PC. The estimates are calculated with the industry model (draft version MasterCSA_8April2010)) CSA (category waterborne latex wall paint at 15% concentration).

Consumer exposure	Exposure estimate	DNEL	Comment
Dermal (mg/kg/day) (on day of application) Dermal (mg/kg/day) (chronic)	21.44 0.30	n/a LTS 206	-
Oral (mg/kg/day)	0,00	LTS 87	-
Inhalation (mg/m3 , mean event)	~375	950	-

Inhalation (mg/m3, chronic)	0.50	LTS 144	
All routes systemic	-	-	-
Environmental exposure estimation is based on Ecetoc TRA model v2 based on ERC8a and d settings and total use of 10.000 tpa. Below presented estimates are based on ERC8d with total use of 10,000 tpa. Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to be degraded for >90% in the STP under evaluated conditions.			
Release times per year (day/year)	365	Local release to air (kg/day)	n.a. wide dispersive
Fraction used at main local source	0,002	Local release to waste water (kg/day)	n.a. wide dispersive
Amount used locally (kg/day)	n.a.	Local release to soil (kg/day)	n.a. wide dispersive

Environmental exposure	PEC	PNEC	Comment
In STP (mg/l)	0,340	580	-
In local freshwater (mg/l)	0,0447	0,96	-
In local soil (mg/kg)	0,0003	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0044	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

15. Exposure Scenario for Consumer use of Ethanol in antifreeze, deicing and screenwash products

Ethanol REACH Association reference no. ES9f

Systematic title based on use descriptor	SU21 PC4 ERC8d
Processes, tasks, activities covered	Covers the consumer use of antifreeze, deicing and screenwash products which contain Ethanol
Assessment Method	Ecetoc TRA integrated model version 2, ConsExpo v 4.1

15.1 Exposure Scenario

15.1.1. Operational conditions and risk management measures

Product categories: Anti-freeze, de-icing and screen-wash consumer products. The exposure is possible during the activities related to transfer from the packaging, mixing and application of the product.

Environmental release category: Wide dispersive indoor and outdoor use of processing aids by the public at large. Use (usually) results in direct release into the sewage system or into environment.

Number of sites using the substance: Substance widely used.

15.1.2 Control of consumer exposure

Substance content in the product	> 25 %
Amounts of product used / applied per event	1 – 50 gram
Exposed skin area	214 cm^2
Frequency and duration of use/exposure	Frequency of use: weekly (up to 50 days per year)
	Duration of exposure per event: < 5 minutes
Setting and external conditions during use	Indoors and / or outdoors
Technical (product related) use conditions	Controlled spray or dosing delivery device.
Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer)	PPE: Eye Protection – suitable eye protection should be worn when handling product if there is a risk of splashing.

15.1.3 Control of environmental exposure

Product characteristics	Physical state	Liquid
	Concentration of substance in product	Can be > 25 %
Amounts used	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use)
	Annually total	125,000 t/year total market
Frequency and duration of use	Pattern of release	365 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Conditions and measures related to municipal sewage treatment plant	Size of STP	> 2000 m^3/day
	Degradation efficacy	90%
	Sludge treatment (disposal or recovery)	Disposal or recovery
Conditions and measures related to disposal of waste resulting from the use of the products	No specific measures required.	

15.2. Exposure estimation

Consumer exposure estimation provided below is only indicative for one particular PC. The estimates are calculated with the industry model (draft version MasterCSA_8April2010)) CSA (PC24 Lock- de-icer with conc 50%).

Consumer exposure	Exposure estimate	DNEL	Comment
Dermal (mg/kg/day)	17,87	LTS 206	Based on one use a day of 0.25hr / event
Oral (mg/kg/day)	0,00	LTS 87	
Inhalation (mg/m3 for 24hr day)	0,51	LTS 144	

All routes systemic	-	-	
Environmental exposure estimation is based on Ecetoc TRA model v2 based on ERC8d and TGD A&B table (MC-IV, IC-6, UC-5) settings. Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by >90% in the STP under evaluated conditions.			
Release times per year (day/year)	365	Local release to air (kg/day)	n.a. wide dispersive
Fraction used at main local source	0,002	Local release to waste water (kg/day)	n.a. wide dispersive
Amount used locally (kg/day)	n.a.	Local release to soil (kg/day)	n.a. wide dispersive

Environmental exposure	PEC	PNEC	Comment
In STP (mg/l)	0,0011	580	-
In local freshwater (mg/l)	0,014	0,96	-
In local soil (mg/kg)	0,00013	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0013	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

16. Exposure Scenario for Consumer use of Ethanol in washing and cleaning products

Ethanol REACH Association reference no. ES9g

Systematic title based on use descriptor	SU21 PC35 ERC8a, ERC8d
Processes, tasks, activities covered	Covers the consumer use of washing and cleaning products which contain Ethanol
Assessment Method	Ecetoc TRA integrated model version 2, ConsExpo v 4.1

16.1 Exposure Scenario

16.1.1. Operational conditions and risk management measures

Product categories: Washing and cleaning products including for example, toilet/bathroom cleaners, dishwashing liquid, laundry detergent etc. The exposure is possible during the activities related to transfer from the packaging, mixing and application of the product.

Environmental release category: Wide dispersive indoor and outdoor use of processing aids by the public at large. Use (usually) results in direct release into the sewage system or into environment.

Number of sites using the substance: Substance widely used.

16.1.2 Control of consumer exposure

Substance content in the product	< 5%	5 – 25 %
Product characteristic (including package design affecting exposure)	Laundry liquid detergents and softeners All purpose cleaners Floor and carpet cleaners	All purpose toilet and bathroom cleaners Glass cleaners Special surfaces cleaners Dish washing liquids
Amounts of product used / applied per event	< 250 gram per event	< 250 gram per event
Frequency and duration of use/exposure	Frequency: daily use	Frequency: daily use
	Duration of exposure: 15 minutes – 1 hour	Duration of exposure: 15 minutes – 1 hour
Setting and external conditions during use	Indoors or outdoors	Indoors or outdoors
Technical (product related) use conditions	When spray application: Controlled spray or delivery device.	When spray application: Controlled spray or delivery device.
Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer)	No specific measures required.	Do not spray empty in small, enclosed areas.

16.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid
	Concentration of substance in product	Up to 25 %
Amounts used	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use)
	Annually total	40,000 t/year total market
Frequency and duration of use	Pattern of release	365 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Conditions and measures related to municipal sewage treatment plant	Size of STP	> 2000 m^3/day
	Degradation efficacy	90%
	Sludge treatment (disposal or recovery)	Disposal or recovery
Conditions and measures related to disposal of waste resulting from the use of the products	No specific measures required.	

16.2. Exposure estimation

Consumer exposure estimation provided below is only indicative for one particular PC. The estimates are calculated with the industry model (draft version MasterCSA_8April2010)) CSA (for category all-purpose liquid cleaners with concentration of the substance at 15%)

Consumer exposure	Exposure estimate	DNEL	Comment
Dermal (mg/kg/day)	10,7	LTS 206	Daily use
Oral (mg/kg/day)	0,00	LTS 87	
Inhalation (mg/m3 for 24hr day)	1,73	LTS 144	
All routes systemic	-	-	

Environmental exposure estimation is based on Ecetoc TRA model v2 based on ERC8a and total volume of 40.000 tpa.
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by >90% in the STP under evaluated conditions.

Release times per year (day/year)	365	Local release to air (kg/day)	n.a. wide dispersive
Fraction used at main local source	0,002	Local release to waste water (kg/day)	n.a. wide dispersive
Amount used locally (kg/day)	n.a.	Local release to soil (kg/day)	n.a. wide dispersive

Environmental exposure	PEC	PNEC	Comment
In STP (mg/l)	0,681	580	-
In local freshwater (mg/l)	0,0818	0,96	-
In local soil (mg/kg)	0,000451	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,00808	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

17. Exposure Scenario for Industrial and Professional use of Ethanol as laboratory agent

Ethanol REACH Association reference no. ES10

Systematic title based on use descriptor	SU3, SU22 PROC15 ERC2, ERC4, ERC8a
Processes, tasks, activities covered	Use as small scale laboratory reagent
Assessment Method	Ecetoc TRA integrated model version 2

17.1 Exposure Scenario

17.1.1. Operational conditions and risk management measures

Process category: Use of substances at small-scale laboratory at production locations, quality control utilities etc.(< 1 l or 1 kg). Larger laboratories and R+D installations should be treated as industrial processes.

Environmental release category: Industrial use of processing aids in a batch process, not becoming part of an article using dedicated or multi-purpose equipment, either technically controlled or operated by manual interventions.

Number of sites using the substance: Substance widely used.

17.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	1 - 4 Hours/day
Human factors not influenced by risk management	Potentially exposed body parts	One hand, face side only
	Exposed skin surface	240 cm^2
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoor
Technical conditions and measures at process level (source) to prevent release	No specific measures identified.	
Technical conditions and measures to control dispersion from source towards the worker	No specific measures identified	
Organisational measures to prevent /limit releases, dispersion and exposure	No specific measures identified.	
Conditions and measures related to personal protection, hygiene and health evaluation	PPE: Eye Protection – suitable eye protection should be worn when handling product if there is a risk of splashing.	

17.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid
	Concentration of substance in product	Up to 100 %
Amounts used	Daily at point source	n.a.
	Annually to the region	500 t/year
	Annually total	5,000 t/year total market
Frequency and duration of use	Pattern of release	Continuous 300 days per year
Environment factors not influenced by risk management	Flow rate of receiving surface water	18,000m3/day (default)
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level (source) to prevent release	No specific onsite measures identified	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	No specific onsite measures identified	

Organizational measures to prevent/limit release from site	Do not release wastewater directly into environment	Wastewater release into municipal STP.
Conditions and measures related to municipal sewage treatment plant	Size of STP	>2000 m^3/day
	Degradation efficacy	90%
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

17.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2..

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	19,21	950	-
Dermal (mg/kd/day)	0,34	343	
Combined (mg/kg/day)	3,09	343	

Environmental exposure estimation is based on Ecetoc TRA model v2 based on ERC 8a for professional use and TGD A&B table (MC-Ic, IC-15, UC-48) for industrial use. Below values are estimates based on the ERC8a approach calculation resulting in more conservative values. All other settings result in lower exposure estimation values.
Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by 90% in the STP under evaluated conditions.

Release times per year (day/year)	365	Local release to air (kg/day)	3
Fraction used at main local source	0,1	Local release to sewage (kg/day)	3
Amount used locally (kg/day)	2,47	Local release to soil (kg/day)	1

Environmental exposure	PEC	PNEC	Comment
In STP (mg/l)	0,170	580	-
In local freshwater (mg/l)	0,027	0,96	-
In local soil (mg/kg)	0,0002	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0027	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2.
If the local environmental emission conditions deviate significantly from the used default values, please use the algorithm below to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)
Example for calculating your local freshwater PEC:
Corrected local freshwater PEC = 0,027 * (your local emission [kg/day] / 3) * (2000 / your local WWTP flow rate [m3/day]) * (18000 / your local river flow rate [m3/day]) * ((1 – your local WWTP efficiency)/0.1)

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.

18. Exposure Scenario for Industrial and Professional use of Ethanol as heat transfer fluid, or other functional fluid

Ethanol REACH Association reference no. ES11

Systematic title based on use descriptor	SU3, SU22 PROC20 ERC7, ERC9a, ERC9b
Processes, tasks, activities covered	Covers use in heat and pressure transfer fluids in dispersive, professional use but closed systems
Assessment Method	Ecetoc TRA integrated model version 2

18.1 Exposure Scenario

18.1.1. Operational conditions and risk management measures

Process category: Heat and pressure transfer fluids in dispersive, professional use but closed systems.

Environmental release categories: Industrial use of substances in closed systems. Use in closed equipment, such as the use of liquids in hydraulic systems, cooling liquids in refrigerators and lubricants in engines and dielectric fluids in electric transformers and oil in heat exchangers. No intended contact with the product produced. Indoor use of substances by the public at large or professional (small scale) use in closed systems. Use in closed equipment, such as the use of cooling liquids in refrigerators, oil-based electric heaters.

Number of sites using the substance: Substance widely used.

18.1.2 Control of workers exposure

Product characteristic (including package design affecting exposure)	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
Amounts used	n.a. in tier1 TRA model	
Frequency and duration of use/exposure	Frequency of exposure (weekly)	n.a.
	Frequency of exposure (annual)	n.a.
	Duration of exposure	n.a.
Human factors not influenced by risk management	Potentially exposed body parts	Two hands, face side only
	Exposed skin surface	480 cm^2
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoor and outdoor
Technical conditions and measures at process level (source) to prevent release	Handle substance within a closed system.	
Technical conditions and measures to control dispersion from source towards the worker	Store substance within a closed system.	
Organisational measures to prevent /limit releases, dispersion and exposure	Substance in a closed system. No intended exposure to the substance.	
Conditions and measures related to personal protection, hygiene and health evaluation	PPE: Eye Protection – suitable eye protection should be worn when handling product if there is a risk of splashing.	

18.1.3 Control of environmental exposure

Product characteristics	Physical state	liquid
	Concentration of substance in product	Up to 100 %
Amounts used	Daily at point source	n.a.
	Annually to the region	1000 t/year
	Annually total	10,000 t/year total market
Frequency and duration of use	Pattern of release	No release into environment (closed system)
Environment factors not influenced by risk management	Flow rate of receiving surface water	n.a.
Other given operational conditions affecting environmental exposure	Processing setting (indoor/outdoor)	Indoors and outdoors
	Processing temperature	Ambient
	Processing pressure	Ambient
Technical conditions and measures at process level (source) to prevent release	No specific measures identified. Handle substance within a closed system.	

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	No specific measures identified. Store substance within a closed system.	
Organizational measures to prevent/limit release from site	Use in closed systems; no intended release into environment.	
Conditions and measures related to municipal sewage treatment plant	Size of STP	>2000 m^3/day
	Degradation efficacy	90%
	Sludge treatment	Disposal or recovery
Conditions and measures related to treatment of waste	All waste products are assumed to be collected and returned for re-processing or re-use. Contain and dispose of waste in accordance with environmental legislation and according to local regulations.	

18.2. Exposure estimation

Workers exposure estimation is calculated with Ecetoc TRA model v2..

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m^3)	38,42	950	-
Dermal (mg/kd/day)	1,71	343	
Combined (mg/kg/day)	7,20	343	

Environmental exposure estimation is based on Ecetoc TRA model v2. Below values are estimates based on the ERC9a approach calculation. Ethanol is fully soluble in water, readily biodegradable, not bio-accumulative, does not accumulate in the sediments or soil and is assumed to degrade by 90% in the municipal STP under evaluated conditions.

Release times per year (day/year)	365	Local release to air (kg/day)	~ 0 (negligible)
Fraction used at main local source	0,1	Local release to sewage (kg/day)	~ 0 (negligible)
Amount used locally (kg/day)	5,5	Local release to soil (kg/day)	~ 0 (negligible)

Environmental exposure	PEC	PNEC	Comment
In STP (mg/l)	~ 0 (negligible)	580	-
In local freshwater (mg/l)	0,0107	0,96	-
In local soil (mg/kg)	0,0002	0,63 (mg/kgwwt)	-
In local marine water (mg/l)	0,0010	0,79	-
Total daily intake via local environment (mg/kgdw/d)	Negligible compared to daily dietary intake and endogenous formation.		

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

The workers exposure and environmental emissions have been evaluated using Ecetoc TRA integrated tool version 2.
If the local environmental emission conditions deviate significantly from the used default values, please use the algorithm below to estimate the correct local emissions and RCRs:
PECcorrected = PECcalculated * (local emission fraction) * (local WWTP flow rate fraction) * (local river flow rate fraction) * (local STP efficiency fraction)

Additional good practice advice beyond the REACH CSA Note: The measures reported in this section have not been taken into account in the exposure estimates related to the exposure scenario above. They are not subject to obligation laid down in Article 37 (4) of REACH	Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.