

# EU SAFETY DATA SHEET : JSC «Novokuibyshevsk Petrochemical Company»

according to Regulation (EC) No. 1907/2006 and Regulation (EC) No. 453/2010

## Ethanol

Date of first version: 21.06.2011

Last update: 02.07.2014

Author : CG International

### Section 1 – Identification of the substance and of the company/undertaking

Product identifier	EC name: ethanol CAS number: 64-17-5 EC number: 200-578-6 REACH registration number: 01-2119457610-43-0267
Relevant identified uses	<u>Function:</u> Solvents Anti-freezing agents Heat transfer agents Fuels and fuel additives Laboratory chemicals Intermediates  <u>Exposure scenarios attached:</u> Manufacture, use as an intermediate or process chemical Distribution Formulation Use industrial applications – non spray applications Use industrial applications –spray applications Industrial use of ethanol as a fuel source Professional use of ethanol as a fuel source Professional use – non spray applications Professional use –spray applications. Consumer use as an automotive fuel Consumer use as a domestic fuel Consumer use in products <50g per event Consumer use in enclosed systems Consumer use in coatings and paints Consumer use in antifreeze, deicing and screenwash products Consumer use in washing and cleaning products. Industrial/Professional use as a laboratory agent Industrial/Professional use as a heat transfer agent
Details of the supplier	JSC «Novokuibyshevsk Petrochemical Company» Russia, 446214, Samara reg., Novokuibyshevsk Tel : +7 84 635 3 08 00 / Fax : +7 846 276 35 93
Emergency telephone number	Only representative : ECORD SARL 71/73 rue Victor Hugo 92400 Courbevoie / France Tel : +33 1 47 45 30 60 / Fax : +33 1 47 45 25 70

### Section 2: Hazards identification

Classification of the substance	According to regulation 1272/2008: Flam. Liquid 2, H225
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	Eye Irrit 2, H319
	According to directive 67/548 Highly Flammable (F), R11
Label elements	According to regulation 1272/2008: Hazard phrases: H225 "Highly flammable liquid and vapour". H319 "Causes serious eye irritation". Signalword: Danger. Pictogram: GHS02, GHS07: 
	According to directive 67/548: Risk phrase: R11 Safety phrases: (S2), S7, S16 Pictogram: 
Other hazards	Does not meet the criteria for PBT or vPvB according to regulation 1907/2006

### Section 3: Composition/Information on ingredients

Constituent (EC name)	CAS number	EC number	Percentage
Ethanol	64-17-5	200-578-6	100%

### Section 4: First aid measures

Description of first aid measures	EYES: Immediately flood the eye with plenty of water for at least 15 minutes, holding the eye open. Remove contact lenses if possible. Obtain medical attention. SKIN: Wash skin with water. Remove contaminated clothing. Obtain medical attention if soreness or redness persists. INGESTION: Do not induce vomiting. Obtain medical attention if symptoms appear or if large quantities have been ingested. Accidental ingestion at a level high enough to be dangerous to health is unlikely. INHALATION: Remove from exposure, taking care to avoid inhaling vapours. Keep warm rest. Obtain medical attention if symptoms appear.
Most important symptoms and effects, both acute and delayed	EYES: Liquid or vapour may cause eye irritation. SKIN: Material may cause slight irritation on

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	<p>prolonged or repeated contact.</p> <p>INGESTION: Swallowing may have the following effects: central nervous system depression, nausea/vomiting, symptoms similar to alcoholic beverage intoxication.</p> <p>INHALATION: Inhalation of high vapour concentrations may cause transient irritation of the respiratory tract, headache, nausea.</p>
Indication of immediate medical attention and special treatment	No special measures required. Treat symptomatically

### Section 5: Firefighting measures

Extinguishing media	<p>SUITABLE: Dry chemical, alcohol resistant foam, carbon dioxide, water spray.</p> <p>UNSUITABLE: Water jet</p>
Special hazards arising from the substance or mixture	<p>SPECIAL EXPOSURE HAZARDS: Flammable liquid and vapour. Oxides of carbon</p> <p>ADDITIONAL INFORMATION: Be aware of possibility of re-ignition. This product gives off flammable vapours which may form explosive mixtures with air. Vapours with a source of ignition can create a flash fire, not a UVCE (Unconfined Vapour Cloud Explosion). Run off to sewer may cause fire or explosion hazard . Containers may explode in heat of fire. Use water spray to cool fire-exposed containers and to disperse vapour.</p>
Advice for firefighters	<p>PROTECTION FOR FIRE-FIGHTERS: Self-contained breathing apparatus with full-face mask and full protective clothing (standard wear).</p>

### Section 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures	<p>Eliminate all sources of ignition. Wear appropriate protective clothing. Avoid breathing vapours. Keep unnecessary people away; isolate hazard area and deny entry. Consider need for evacuation. Stay up wind and keep out of low areas where vapour may accumulate and ignite. Stop leak if this can be achieved without risk.</p> <p>For advice on personal protection clothing, see chapter 8.</p>
Environmental precautions	Try to prevent the material from entering drains or water courses. Advise Authorities if spillage has entered water course or sewer or has contaminated

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	soil or vegetation.
Methods and materials for containment and clear up	Small spills: Allow to evaporate if it is safe to do so or contain and absorb using earth, sand or other inert material then transfer into suitable containers for recovery or disposal. Ventilate contaminated area thoroughly. Use non-sparking tools. Do not use electrical equipment unless it is intrinsically safe. Large spills: Dike or dam to contain for later disposal. Cover drains. Contact emergency authorities
Reference to other sections	Section 8 contains more detailed advice on personal protective equipment and section 13 on waste disposal.

### Section 7: Handling and Storage

Precautions for safe handling	Avoid inhaling vapour. Avoid contact with eyes, skin and clothing. Suitable equipment for dealing with fires, spills and leaks must be readily available. Earth all equipment. Use explosion protected electrical equipment and lighting. Use closed-system transfers wherever possible. Earth (ground) lines and equipment used. Do not smoke eat or drink in areas of use and storage.
Conditions for safe storage, including any incompatibilities	Storage area should be cool, dry, well ventilated, out of direct sunlight and separated from oxidants and strong mineral acids. Store in original containers. Keep containers tightly closed. Store in a bunded area. Store away from sources of heat or ignition. Storage tanks should have equipotential electrical bonding and be earthed. Incompatible materials: natural rubber, PVC, methyl-methacrylate plastics, polyamides, zinc, brass, aluminium under certain conditions. Compatible materials: Stainless steel, titanium, cast bronze, cast iron, carbon steel, polypropylene, neoprene, nylon, Viton, ceramic, carbon, glass.
Specific end uses	Please refer to exposure scenarios attached to this safety data sheet

### Section 8: Exposure controls/personal protection

Control parameters	Inhalation DNEL (short term, local): 1900mg/m <sup>3</sup> (1000ppm) Inhalation DNEL (long term, systemic) :950mg/m <sup>3</sup> (500ppm) Dermal DNEL (long term, systemic): 343mg/kgbw/day PNEC aqua (freshwater): 0.96mg/l PNEC aqua (marine water): 0.79mg/l PNEC aqua (intermittent release): 2.75mg/l
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	<p>PNEC STP: 580mg/l PNEC sediment (freshwater): 3.6mg/kgdw PNEC sediment (marine water): 2.9mg/kgdw PNEC soil: 0.63 mg/kgdw PNEC oral: 0.72g/kg food</p>
Exposure controls	<p>Use of the basic principles of Industrial Hygiene will enable this material to be used safely. Exposure to this material may be controlled in a number of ways. The measures appropriate for a particular worksite depend on how the material is used and on the potential for exposure. If engineering controls and work practices are not effective in preventing or controlling exposure, then suitable personal equipment, which is known perform satisfactorily, should be used.</p> <p>EYE PROTECTION: Wear safety goggles.</p> <p>SKIN PROTECTION: Wear gloves with breakthrough times &gt;480 minutes: Nitrile rubber gloves. Butyl rubber gloves. (complying to EN 374-3, typically &gt;0.5mm thick) The exact choice of glove type depends on the type of work being undertaken. Gloves should be chosen in consultation with a glove manufacturer and after a full assessment of the working conditions. Gloves should be replaced regularly.</p> <p>OTHER: Body Protection: Standard work wear and safety boots for normal handling and use.</p> <p>RESPIRATORY PROTECTION: Use with adequate ventilation. In case of insufficient local exhaust ventilation and/or handling with open equipment: Respiratory air fed breathing apparatus if there is a risk of exposure to high vapour concentrations. If using a half mask: organic vapour cartridge Ax type.</p> <p>Environmental exposure controls: Ethanol is classed as a VOC under Solvent Emissions directive 99/13. Abatement control measures such as incineration or solvent recovery should be used in combination with fugitive emission controls to ensure compliance with this directive.</p>

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### Section 9: Physical and Chemical properties

Appearance	colourless liquid
Odour	mild but typical alcoholic odour.
Odour threshold	No data
pH	Neutral
Melting point (@101325Pa)	-114C (at 101325Pa)
Boiling point (@101325Pa)	78c (at 101325Pa)
Flash point	13C
Evaporation rate	No data
Flammability (solid/gas)	Not applicable
Upper/lower flammability or explosive limits	LEL: 2.5%, UEL: 13.5%
Vapour pressure	5726Pa at 20C
Vapour density	No data
Relative density	0.7844 at 25C
Solubility(ies)	Fully miscible with water
Partition co-efficient: n-octanol/water	-0.35 at 20C
Auto-ignition temperature	363C at 101325Pa
Decomposition temperature	No data
Viscosity	1.2mPas at 20C
Explosive properties	Not explosive
Oxidising properties	Not oxidising
Other information	None

### Section 10: Stability and Reactivity

Reactivity	May react violently with very strong oxidising agents (eg perchlorates).
Chemical stability	Stable under normal conditions
Possibility of hazardous reactions	No hazardous reactions anticipated
Conditions to avoid	High temperatures. Proximity to sources of ignition
Incompatible materials	Strong mineral acids, oxidising agents. Aluminium at

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	higher temperatures
Hazardous decomposition products	Combustion will generate oxides of carbon.

### Section 11: Toxicological information

Information on toxicological effects	
Acute toxicity	<p>ORAL (OECD401 equivalent): Rat LD50: 6.2 – 15g/kgbw</p> <p>INHALATION (OECD403 equivalent): Rat LC50 (4hr) &gt;50mg/l</p> <p>DERMAL: No data available.</p> <p>Available data indicates that classification criteria are not met.</p>
Skin corrosion/irritation	<p>All available acute 4 hour exposure studies show not irritating in animals (OECD404 or equivalent) and humans. In humans, repeated dose studies show no irritation with repeated application over a whole day under occlusive conditions for up to 12 days. Further exposures cause irritation to occur.</p> <p>Available data indicates that classification criteria are not met.</p>
Serious eye damage/irritation	<p>Studies according to OECD guideline405 generally cause moderate eye irritation. All effects disappear within 8-14 days. The level of response is insufficient to trigger classification under directive 67/548 but is sufficient in terms of conjunctival response to require classification as a category 2 irritant under regulation 1272/2008.</p>
Respiratory or skin sensitisation	<p>Mouse swelling study: negative</p> <p>Local Lymph Node Assay (OECD429): Negative</p> <p>Guinea Pig maximisation study: (OECD406) Negative</p> <p>Respiration sensitisation: no data available.</p> <p>Available data indicates that classification criteria are not met.</p>
Germ cell mutagenicity	<p>Bacterial reverse mutation studies (OECD471): all negative</p> <p>In vitro cytogenicity studies (eg OECD473): negative without metabolic activation. No studies available with metabolic activation.</p> <p>In vitro mammalian cell gene mutation studies (ef OECD476): negative with and without metabolic activation.</p> <p>In vivo micronucleus test (OECD474): no convincing</p>

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	<p>evidence that ethanol causes micronuclei in the bone marrow.</p> <p>In vivo chromosome aberration test (OECD475): negative.</p> <p>Dominant Lethal assay (OECD478): Ethanol is unlikely to produce an effect up to the maximum tolerated dose.</p> <p>There is some evidence from in vitro studies that ethanol can cause genotoxic or clastogenic effects. However, the effects seen are weak and only occur at very high doses.. The balance of evidence is that ethanol is not genotoxic. Available data indicates that classification criteria are not met.</p>
Carcinogenicity	<p>Rats: NOAEL&gt;3000mg/kg Mice: Females NOAEL&gt;4400mg/kg, Males NOAEL&gt;4250mg/kg based on historic control data, BMDL10=1400mg/kg based on concurrent control data.</p> <p>In humans, the consumption of alcoholic beverages is associated with an increased incidence of certain tumours. There is no evidence that the exposure of humans to ethanol other than by repeated consumption of alcoholic beverages may result in an increase in cancer incidence. From the available data, the classification criteria are not met.</p>
Reproductive toxicity	<p>FERTILITY: NOAEL (oral, mouse) = 13.8g/kg (OECD416 equiv.) NOAEC (inhalation, rat) &gt;16,000ppm DEVELOPMENTAL TOXICITY (OECD414 equiv): NOAEL (oral) = 5.2g/kgbw/day NOAEC (inhalation) = 39mg/l.</p> <p>In humans excessive consumption of alcoholic beverages during pregnancy is associated with the induction of Foetal Alcohol Syndrome in the offspring causing reduced birth weight and physical and mental defect to occur. There is no evidence that such effects might be caused by exposures other than direct ingestion of alcoholic drinks. Blood ethanol concentrations resulting from ethanol exposure by any route other than deliberate and repeated oral consumption are unlikely to reach levels associated with reproductive or developmental effects. From the available data, it can be concluded that it is impossible to reach the doses of ethanol required to produce any</p>



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	sort of adverse reproductive response other than by repeated oral consumption of large amounts of ethanol, doses normally only associated with problem drinking, and therefore classification for reproductive or developmental toxicity in the context of a chemical substance is not appropriate or warranted.
STOT – single exposure	No specific target organ effects observed following single exposure.
STOT – repeated exposure	In sub-chronic feeding or drinking water studies in rats, NOAELs ranged from 1.73g/kg to 3.9g/kg. The most sensitive affect above these doses appeared to be to the kidney in males. Effects are only seen at doses well above the levels that would require classification.
Aspiration hazard	No aspiration hazard expected.
Toxicokinetics	In humans, ethanol is readily absorbed by the oral and inhalation routes, is distributed throughout all tissues and organs and is readily, metabolized and excreted. At exposures relevant to occupational inhalation exposure, the alcohol dehydrogenase metabolic route in the liver dominates and does not become saturated. Ethanol is not accumulated in the body. Dermal uptake of ethanol is very low.
Likely routes of exposure	Inhalation is the most likely route of exposure during normal use. Dermal uptake only likely under extended exposure under occluded conditions. Substance is readily absorbed following ingestion.
Symptoms related to the physical and toxicological characteristics	INGESTION: Swallowing may have the following effects: central nervous system depression, nausea/vomiting, symptoms similar to alcoholic beverage intoxication. INHALATION: Inhalation of high vapour concentrations may cause transient irritation of the respiratory tract, headache, nausea.
Delayed effects	Delayed effects not expected.

## Section 12: Ecological Information

Toxicity	FISH: LC50 (96hr) <i>Salmo gairdneri</i> : 13g/l; <i>Pimephales promelas</i> : 13.5, 14.2 and 15.3g/l. INVERTEBRATES FRESHWATER EC50 (48hr) <i>Daphnia Magna</i> : 12.34g/l; NOEC (reproduction, 21 days): >10mg/l. <i>Ceriodaphnia dubia</i> : EC50 (48hrs): 5.012g/l; NOEC (reproduction, 10 days): 9.6mg/l. <i>Palaemonetes pugio</i> NOEC (developmental, 10 days): 79mg/l. INVERTEBRATES SALTWATER EC50 (24hr) <i>Artemia</i>
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	<p>salina 23.9, &gt;10g/l; EC50 (48hr) Artemia salina nauplii: 857mg/l</p> <p>AQUATIC ALGAE FRESHWATER: Chlorella vulgaris, 72hr: EC50 275mg/l, EC10 11.5mg/l; Selenastrum capricornutum, 72hr, EC50: 12.9g/l, EC10=0.44g/l; Chlamydomonas eugametos, 48hr, EC50: 18g/l, NOEC=7.9g/l</p> <p>AQUATIC ALGAE SALTWATER: Skeletonema costatum, NOEC (5 days): 3.24g/l.</p>
Persistence and biodegradability	The product is readily biodegradable. BOD <sub>20</sub> =84%. Substance is expected to degrade readily in sewage treatment plants.
Bioaccumulation potential	Based on the partition coefficient, the substance has a low bioaccumulation potential
Mobility in soil	If released to air or water the product will disperse rapidly. If released to soil it will evaporate at a rapid rate. The product is volatile and water soluble. If released to the environment it will partition to air and water. The product is poorly absorbed on to soil or sediments.
Results of the PBT assessment	<p>Persistence Assessment: Substance is readily biodegradable and is therefore neither P nor vP.</p> <p>Bioaccumulation Assessment: Substance logKow&lt;4.5 and is therefore it is neither B nor vB.</p> <p>Toxicity Assessment: Acute aquatic toxicity (LC50 and EC50) &gt;0.1mg/l. Substance is neither carcinogenic, mutagenic nor teratogenic. Substance is not T.</p>
Other adverse effects	No other adverse effects known.

## Section 13: Disposal considerations

Waste treatment methods	<p>SUBSTANCE DISPOSAL: Dispose of in accordance with all applicable local and national regulations. Use recovery/recycling where feasible, otherwise incineration is the recommended method of disposal. If correctly incinerated this material will decompose to carbon dioxide and water only.</p> <p>CONTAINER DISPOSAL: Empty containers may contain hazardous residues. Do not cut, puncture or weld on or near to the container. Labels should not be removed from containers until they have been</p>
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	cleaned. Contaminated containers must not be treated as household waste. Containers should be cleaned by appropriate methods and then re-used or disposed of by landfill or incineration as appropriate. Do not incinerate closed containers
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### Section 14: Transport information

UN number	1170
UN proper shipping name	ethanol
Transport hazard class(es)	3
Packing group	II
Environmental hazards	No special hazard
Special precautions for user	No special precautions required
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code	No data available

### Section 15: Regulatory information

Safety, Health and Environmental regulations	No data available
Chemical Safety assessment	A chemical safety assessment has been carried out for this substance.

### Section 16: Other information

Abbreviations	BMDL10 = Benchmark dose level of 10% EC50 = Concentration having a 50% effect LD50 = Dose causing 50% deaths PBT = Persistent, Bioaccumulative, Toxic vPvB = very persistent, very bioaccumulative. NO(A)EL/C = No (adverse) effect level/concentration OECD = Organisation for economic co-operation and development
Full classifications	Flam. Liquid 2: Flammable liquid category 2

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	Eye irrit 2: Eye irritant category 2.
Full risk phrases (directive 67/548)	R11 Highly flammable
Full Safety phrases (directive 67/548)	S2: Keep out of the reach of children S7: Keep container tightly closed S16 Keep away from sources of ignition – no smoking
Full Hazard phrases (regulation 1272/2008)	H225 Highly flammable liquid and vapour H319 Causes serious eye irritation
Other information relating to regulation 1272/2008:	Specific concentration limits: According to the available data, a specific concentration limit of 50% can be applied to the classification of mixtures containing this substance for the eye irritancy classification end point

Ethanol

(CH<sub>3</sub>-CH<sub>2</sub>-OH)

CAS: 64-17-5

## Exposure Scenarios for Safety Data Sheets

## CSR Variant 5- Importer or Ordinary Representatives, all uses

<b>Title: Exposure Scenario for Industrial manufacturing of Ethanol, or use as intermediate or process chemical</b>		
<b>Ethanol REACH Association reference no. ES1</b>		
<b>Systematic title based on use descriptor</b>	SU3, SU8, SU9 PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b ERC1, ERC4, ERC6A	
<b>Processes, tasks, activities covered</b>	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.	
<b>Assessment Method</b>	Ecetoc TRA integrated model version 2, EUSES v.2.	
<b>1. Exposure Scenario</b>		
<b>1.1 Operational conditions and risk management measures</b>		
<p>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.</p> <p>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.</p> <p>Number of sites using the substance: Substance widely used.</p>		
<b>1.2 Control of workers exposure</b>		
<b>Product characteristic (including package design affecting exposure)</b>	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
<b>Amounts used</b>	n.a. in tier1 TRA model	
<b>Frequency and duration of use/exposure</b>	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
<b>Human factors not influenced by risk management</b>	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 <sup>2</sup> (automated processes/PROC1, 2, 3,4) 960 cm <sup>2</sup> (transfer, filling, etc./PROC8a,b)
<b>Other given operational conditions affecting workers exposure</b>	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Outdoor
<b>Technical conditions and measures at process level (source) to prevent release</b>	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.	
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	Ventilation	None required
	Efficiency rate	95 %
<b>Organisational measures to prevent /limit releases, dispersion and exposure</b>	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.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	PPE: Respiratory Protection	Not required for normal operations

### 1.3 Control of environmental exposure

<b>Product characteristics</b>	Physical state	liquid
	Concentration of substance in product	Up to 100 %
<b>Amounts used</b>	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
<b>Frequency and duration of use</b>	Pattern of release	Continuous 350 days per year
<b>Environment factors not influenced by risk management</b>	Flow rate of receiving surface water	18,000m <sup>3</sup> /day (default)
<b>Other given operational conditions affecting environmental exposure</b>	Processing setting (indoor/outdoor)	Indoor and/or outdoor
	Processing temperature	Ambient
	Processing pressure	Ambient
<b>Technical conditions and measures at process level (source) to prevent release</b>	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	
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	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)
<b>Organizational measures to prevent/limit release from site</b>	Do not release wastewater directly into environment	Wastewater release into local or municipal STP.
<b>Conditions and measures related to municipal sewage treatment plant</b>	Size of STP	>= 2000 m <sup>3</sup> /day
	Degradation efficacy	90% (for ethanol)
	Sludge treatment	Disposal or recovery
<b>Conditions and measures related to treatment of waste</b>	Hazardous waste incineration or dispose for use in recycled fuels	

## 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
<b>Inhalation (mg/m<sup>3</sup>)</b>	96.04	950 (OEL)	PROC 8a results in the highest exposure in this exposure scenario
<b>Dermal (mg/kg/day)</b>	13.71	343	
<b>Combined (mg/kg/day)</b>	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.

<b>Release times per year (day/year)</b>	350	Local release to air (kg/day)	226.0
<b>Fraction used at main local source</b>	0.086	Local release to waste water (kg/day)	11.3
<b>Amount used locally (kg/day)</b>	0	Local release to soil (kg/day)	0
<b>Environmental exposure</b>	PEC	PNEC	<b>Comment</b>
<b>In STP / untreated wastewater(mg/l)</b>	5.65	580	-
<b>In local freshwater (mg/l)</b>	0,0000264	0,96	-
<b>In local soil</b>	0,00119 (mg/kg)	0,63 (mg/kgwwt)	-
<b>In local marine water (mg/l)</b>	0,00000224	0,79	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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 =  $0,0000264 * (\text{your local emission [kg/day]} / 350) * (2000 / \text{your local WWTP flow rate [m3/day]}) * (18000 / \text{your local river flow rate [m3/day]}) * ((1 - \text{your local WWTP efficiency})/0.1)$

### **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.

<b>Title: Exposure Scenario for Industrial distribution of Ethanol</b>		
<b>Ethanol REACH Association reference no. ES2</b>		
<b>Systematic title based on use descriptor</b>	SU3, SU8, SU9 PROC8a, PROC8b, PROC9 ERC2	
<b>Processes, tasks, activities covered</b>	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.	
<b>Assessment Method</b>	Ecetoc TRA integrated model version 2	
<b>1. Exposure Scenario</b>		
<b>1.1 Operational conditions and risk management measures</b>		
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.		
<b>1.2 Control of workers exposure</b>		
<b>Product characteristic (including package design affecting exposure)</b>	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
<b>Amounts used</b>	n.a. in tier1 TRA model	
<b>Frequency and duration of use/exposure</b>	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
<b>Human factors not influenced by risk management</b>	Potentially exposed body parts	Two hands
	Exposed skin surface	960 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Outdoor or in ventilated (open) spaces
<b>Technical conditions and measures at process level (source) to prevent release</b>	No specific technical prevention measures required	
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	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.
<b>Organisational measures to prevent /limit releases, dispersion and exposure</b>	No specific measures identified.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	Wear suitable gloves tested to EN374 during the activities where skin contact is possible.	
<b>1.3 Control of environmental exposure</b>		
<b>Product characteristics</b>	Physical state	liquid
	Concentration of substance in product	Up to 100 %
<b>Amounts used</b>	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
<b>Frequency and duration of use</b>	Pattern of release	300 days per year
<b>Environment factors not influenced by</b>	Flow rate of receiving surface water	18,000m <sup>3</sup> /day (default)



risk management		
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 <sup>3</sup> /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. 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 <sup>3</sup> )	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-1b, 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
<b>Environmental exposure</b>	PEC	PNEC	<b>Comment</b>
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:

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

Example for calculating your local freshwater PEC:

$Corrected\ freshwater\ PEC = 0,104 * (your\ local\ emission\ [kg/day] / 15) * (2000 / your\ local\ WWTP\ flow\ rate\ [m^3/day]) * (18000 / your\ local\ river\ flow\ rate\ [m^3/day]) * ((1 - your\ local\ WWTP\ efficiency)/0.1)$

## 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.

Title: Exposure Scenario for Industrial formulation and (re)packing of Ethanol, and its mixtures		
Ethanol REACH Association reference no. <b>ES3</b>		
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.	
1. Exposure Scenario		
1.1 Operational conditions and risk management measures		
<p><b>Process category:</b> 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.</p> <p><b>Environmental release category:</b> 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</p> <p>Number of sites using the substance: Substance widely used.</p>		
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 <sup>2</sup> (automated processes/PROC3) 960 cm <sup>2</sup> (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	No specific measures required. Wear suitable gloves tested to EN374 during the activities where excessive skin contact is possible.	
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	280,000 t/year (maximum at point source in worst case)
	Annually total	3,800,000 t/year

<b>Frequency and duration of use</b>	Pattern of release	Continuous 300 days per year
<b>Environment factors not influenced by risk management</b>	Flow rate of receiving surface water	18,000m <sup>3</sup> /day (default)
<b>Other given operational conditions affecting environmental exposure</b>	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
<b>Technical conditions and measures at process level (source) to prevent release</b>	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.	
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	Apply technical measures aiming at reduction and cleaning of waste water (WWTP/local STP (e.g. biological treatment))	Efficacy >90%
<b>Organizational measures to prevent/limit release from site</b>	Do not release wastewater directly into environment	Wastewater release into municipal STP.
<b>Conditions and measures related to municipal sewage treatment plant</b>	Size of STP	>2000 m <sup>3</sup> /day
	Degradation efficacy	90% (for ethanol)
	Sludge treatment	Disposal or recovery
<b>Conditions and measures related to treatment of waste</b>	Hazardous waste incineration or dispose for use in recycled fuels	

## 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
<b>Inhalation (mg/m<sup>3</sup>)</b>	96.04	950	PROC 8a results in the highest exposure in this exposure scenario
<b>Dermal (mg/kd/day)</b>	13.71	343	
<b>Combined (mg/kg/day)</b>	27.43	343	

**Environmental exposure** estimation is based on Ecetoc TRA model v2 including the data from TGD A&B tables (MC-lb, 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.

<b>Release times per year (day/year)</b>	300	Local release to air (kg/day)	469
<b>Fraction used at main local source</b>	0.1	Local release to waste water (kg/day)	28
<b>Amount used locally (kg/day)</b>	93.333	Local release to soil (kg/day)	9
<b>Environmental exposure</b>	PEC	PNEC	<b>Comment</b>
<b>In STP / untreated wastewater(mg/l)</b>	1.73	580	-
<b>In local freshwater (mg/l)</b>	0,185	0,96	-
<b>In local soil</b>	0.0117 (mg/kg)	0,63 (mg/kgwwt)	-
<b>In local marine water (mg/l)</b>	0,0186	0,79	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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:  
 $PEC_{corrected} = PEC_{calculated} * (\text{local emission fraction}) * (\text{local WWTP flow rate fraction}) * (\text{local river flow rate fraction}) * (\text{local STP efficiency fraction})$   
**Example for calculating your local freshwater PEC:**  
 $Corrected \text{ local freshwater } PEC = 0,185 * (\text{your local emission [kg/day]} / 28) * (2000 / \text{your local WWTP flow rate [m}^3\text{/day]}) * (18000 / \text{your local river flow rate [m}^3\text{/day]}) * ((1 - \text{your local WWTP efficiency})/0.1)$

## 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.

**Title: Exposure Scenario for Industrial use of Ethanol in non-spray applications**

**Ethanol REACH Association reference no. ES4**

<b>Systematic title based on use descriptor</b>	SU3 PROC10, PROC13 ERC4
<b>Processes, tasks, activities covered</b>	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.
<b>Assessment Method</b>	Ecetoc TRA integrated model version 2

**1. Exposure Scenario**

**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 dyeing, 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.

**1.2 Control of workers exposure**

<b>Product characteristic (including package design affecting exposure)</b>	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
<b>Amounts used</b>	n.a. in tier1 TRA model	
<b>Frequency and duration of use/exposure</b>	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
<b>Human factors not influenced by risk management</b>	Potentially exposed body parts	Two hands, face side only (PROC13) Two hands (PROC10)
	Exposed skin surface	480 cm <sup>2</sup> (PROC13) 960 cm <sup>2</sup> (PROC10)
<b>Other given operational conditions affecting workers exposure</b>	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors and outdoors
<b>Technical conditions and measures at process level (source) to prevent release</b>	No specific measures identified.	
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	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.	
<b>Organisational measures to prevent /limit releases, dispersion and exposure</b>	No specific measures identified.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	No specific PPE measures required. Wear suitable gloves tested to EN374 during the activities where prolonged or frequent skin contact is possible.	

**1.3 Control of environmental exposure**

<b>Product characteristics</b>	Physical state	liquid
	Concentration of substance in product	Up to 100 %
<b>Amounts used</b>	Daily at point source	n.a.
	Annually to the region	2,750 t/year (general)
	Annually total	27,500 t/year (general) total market
<b>Frequency and duration of use</b>	Pattern of release	300 days per year

<b>Environment factors not influenced by risk management</b>	Flow rate of receiving surface water	18,000m <sup>3</sup> /day (default)
<b>Other given operational conditions affecting environmental exposure</b>	Processing setting (indoor/outdoor)	Indoors and outdoors
	Processing temperature	Ambient
	Processing pressure	Ambient
<b>Technical conditions and measures at process level (source) to prevent release</b>	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.	
<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	Apply technical measures aiming at reduction and cleaning of waste water (WWTP/local STP (e.g. biological treatment))	Efficacy >70%
<b>Organizational measures to prevent/limit release from site</b>	Do not release wastewater directly into environment	Wastewater release into municipal STP.
<b>Conditions and measures related to municipal sewage treatment plant</b>	Size of STP	>2000 m <sup>3</sup> /day
	Degradation efficacy	90% (for ethanol)
	Sludge treatment	Disposal or recovery
<b>Conditions and measures related to treatment of waste</b>	Hazardous waste incineration or dispose for use in recycled fuels	

## 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 <sup>3</sup> )	96.04	950	PROC 10 results in the highest exposure in this exposure scenario
Dermal (mg/kg/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-lb, IC-14, UC-48, fraction main source 0,1 using local STP and MC-lc, 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.

<b>Release times per year (day/year)</b>	300	Local release to air (kg/day)	367
<b>Fraction used at main local source</b>	0.1	Local release to waste water (kg/day)	5
<b>Amount used locally (kg/day)</b>	458	Local release to soil (kg/day)	1
<b>Environmental exposure</b>	PEC	PNEC	<b>Comment</b>
<b>In STP / untreated wastewater(mg/l)</b>	0.285	580	-
<b>In local freshwater (mg/l)</b>	0,039	0,96	-
<b>In local soil</b>	0,0091 (mg/kg)	0,63 (mg/kgwwt)	-
<b>In local marine water (mg/l)</b>	0,0039	0,79	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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:

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

Example for calculating your local freshwater PEC:

$Corrected\ freshwater\ PEC = 0,039 * (\text{your local emission [kg/day]} / 5) * (2000 / \text{your local WWTP flow rate [m}^3/\text{day]}) * (18000 / \text{your local river flow rate [m}^3/\text{day]}) * ((1 - \text{your local WWTP efficiency})/0.1)$

## 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.

**Title: Exposure Scenario for Industrial use of Ethanol in spray applications**

**Ethanol REACH Association reference no. ES5**

<b>Systematic title based on use descriptor</b>	SU3 PROC7 ERC4
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**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

**1. Exposure Scenario**

**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.

**1.2 Control of workers exposure**

<b>Product characteristic (including package design affecting exposure)</b>	Physical state	liquid
	Concentration of substance in product	Up to 25 %
	Vapour pressure of substance	5,73 kPa
<b>Amounts used</b>	n.a. in tier1 TRA model	
<b>Frequency and duration of use/exposure</b>	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
<b>Human factors not influenced by risk management</b>	Potentially exposed body parts	Two hands and forearms
	Exposed skin surface	1500 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors
<b>Technical conditions and measures at process level (source) to prevent release</b>	No specific measures identified.	
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	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.	
<b>Organisational measures to prevent /limit releases, dispersion and exposure</b>	No specific measures identified.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	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.	

**1.3 Control of environmental exposure**

<b>Product characteristics</b>	Physical state	liquid
	Concentration of substance in product	Up to 25 %
<b>Amounts used</b>	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
<b>Frequency and duration of use</b>	Pattern of release	Continuous 300 days per year
<b>Environment factors not influenced by risk management</b>	Flow rate of receiving surface water	18,000m <sup>3</sup> /day (default)



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

## 2. Exposure estimation

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

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m <sup>3</sup> )	480.21	950	Exposure estimates and RCRs given here are calculated for conditions without LEV (worst case scenario).
Dermal (mg/kg/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-1b, 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.

<b>Release times per year (day/year)</b>	300	Local release to air (kg/day)	367
<b>Fraction used at main local source</b>	0.1	Local release to waste water (kg/day)	5
<b>Amount used locally (kg/day)</b>	458	Local release to soil (kg/day)	1
<b>Environmental exposure</b>	PEC	PNEC	<b>Comment</b>
<b>In STP / untreated wastewater(mg/l)</b>	0.285	580	-
<b>In local freshwater (mg/l)</b>	0,039	0,96	-
<b>In local soil</b>	0.0091 (mg/kg)	0,63 (mg/kgwwt)	-
<b>In local marine water (mg/l)</b>	0,0039	0,79	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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:

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

Example for calculating your local freshwater PEC:

$Corrected\ freshwater\ PEC = 0,039 * (\text{your local emission [kg/day]} / 5) * (2000 / \text{your local WWTP flow rate [m3/day]}) * (18000 / \text{your local river flow rate [m3/day]}) * ((1 - \text{your local WWTP efficiency})/0.1)$

### 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.

Title: 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	
1. Exposure Scenario		
1.1 Operational conditions and risk management measures		
<p>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.</p> <p>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.</p> <p>Number of sites using the substance: Substance widely used.</p>		
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 <sup>2</sup>
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.	
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	18,000m <sup>3</sup> /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.	



<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	Apply technical measures aiming at reduction and cleaning of waste water (WWTP/local STP (e.g. biological treatment))	Efficacy >70%
<b>Organizational measures to prevent/limit release from site</b>	Do not release wastewater directly into environment	Wastewater release into municipal STP.
<b>Conditions and measures related to municipal sewage treatment plant</b>	Size of STP	>2000 m <sup>3</sup> /day
	Degradation efficacy	90%
	Sludge treatment	Disposal or recovery
<b>Conditions and measures related to treatment of waste</b>	Hazardous waste incineration or dispose for use in recycled fuels	

## 2. Exposure estimation

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

Workers exposure	Exposure estimate	DNEL	Comment
<b>Inhalation (mg/m<sup>3</sup>)</b>	9.6	950	-
<b>Dermal (mg/kg/day)</b>	0.3	343	
<b>Combined (mg/kg/day)</b>	1.7	343	

**Environmental exposure** estimation is based on Ecetoc TRA model v2 including the data from TGD A&B tables (MC-1c, 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.

<b>Release times per year (day/year)</b>	350	Local release to air (kg/day)	9
<b>Fraction used at main local source</b>	0.02	Local release to waste water (kg/day)	1
<b>Amount used locally (kg/day)</b>	1714	Local release to soil (kg/day)	2
<b>Environmental exposure</b>	PEC	PNEC	<b>Comment</b>
<b>In STP / untreated wastewater(mg/l)</b>	0,053	580	-
<b>In local freshwater (mg/l)</b>	0,0152	0,96	-
<b>In local soil</b>	0.0006 (mg/kg)	0,63 (mg/kgwwt)	-
<b>In local marine water (mg/l)</b>	0,0016	0,79	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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:

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

Example for calculating your local freshwater PEC:

$Corrected\ freshwater\ PEC = 0,0152 * (\text{your local emission [kg/day]} / 5) * (2000 / \text{your local WWTP flow rate [m3/day]}) * (18000 / \text{your local river flow rate [m3/day]}) * ((1 - \text{your local WWTP efficiency})/0.1)$

## 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.

Title: 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	
1. Exposure Scenario		
1.1 Operational conditions and risk management measures		
<p>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.</p> <p>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.</p> <p>Number of sites using the substance: Substance widely used.</p>		
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 <sup>2</sup>
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.	
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	18,000m <sup>3</sup> /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	Do not discharge into sewers or drains.	

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

## 2. Exposure estimation

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

<b>Workers exposure</b>	Exposure estimate	DNEL	Comment
<b>Inhalation (mg/m<sup>3</sup>)</b>	9.6	950	-
<b>Dermal (mg/kg/day)</b>	0.3	343	
<b>Combined (mg/kg/day)</b>	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.

<b>Release times per year (day/year)</b>	365	Local release to air (kg/day)	n.a. wide dispersive
<b>Fraction used at main local source</b>	0,002	Local release to sewage (kg/day)	n.a. wide dispersive
<b>Amount used locally (kg/day)</b>	2082	Local release to soil (kg/day)	n.a. wide dispersive
<b>Environmental exposure</b>	PEC	PNEC	Comment
<b>In STP (mg/l)</b>	0,065	580	-
<b>In local freshwater (mg/l)</b>	0,0240	0,96	-
<b>In local soil (mg/kg)</b>	0,0273	0,63 (mg/kgwwt)	-
<b>In local marine water (mg/l)</b>	0,0034	0,79	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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:  
 $PEC_{corrected} = PEC_{calculated} * (local\ emission\ fraction) * (local\ WWTP\ flow\ rate\ fraction) * (local\ river\ flow\ rate\ fraction) * (local\ STP\ efficiency\ fraction)$   
**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.

<b>Title: Exposure Scenario for Professional use of Ethanol in non-spray applications</b>		
<b>Ethanol REACH Association reference no. ES7</b>		
<b>Systematic title based on use descriptor</b>	SU22 PROC10, PROC13, PROC14, PROC19 ERC8a, ERC8d	
<b>Processes, tasks, activities covered</b>	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.	
<b>Assessment Method</b>	Ecetoc TRA integrated model version 2	
<b>1. Exposure Scenario</b>		
<b>1.1 Operational conditions and risk management measures</b>		
<p>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 dyeing, 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 (&lt; 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.</p> <p>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.</p> <p>Number of sites using the substance: Substance widely used.</p>		
<b>1.2 Control of workers exposure</b>		
<b>Product characteristic (including package design affecting exposure)</b>	Physical state	liquid
	Concentration of substance in product	Up to 100 %
	Vapour pressure of substance	5,73 kPa
<b>Amounts used</b>	n.a. in tier1 TRA model	
<b>Frequency and duration of use/exposure</b>	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	240 Days/year
	Duration of exposure	> 4 Hours/day
<b>Human factors not influenced by risk management</b>	Potentially exposed body parts	Two hands, face side only (PROC13, 14) Two hands (PROC10) Two hands and forearms (PROC19)
	Exposed skin surface	480 cm <sup>2</sup> (PROC13, 14) 960 cm <sup>2</sup> (PROC10) 1980 cm <sup>2</sup> (PROC19)
<b>Other given operational conditions affecting workers exposure</b>	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors and outdoors
<b>Technical conditions and measures at process level (source) to prevent release</b>	If >4 hours/day (PROC19)	Limit the substance concentration in the product to 25%
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	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.	
<b>Organisational measures to prevent /limit releases, dispersion and exposure</b>	No specific measures identified.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	If PROC 19 and concentration >25%	PPE: Wear suitable gloves tested to EN374 and avoid skin contact
<b>1.3 Control of environmental exposure</b>		
<b>Product characteristics</b>	Physical state	liquid
	Concentration of substance in product	Up to 100 %
<b>Amounts used</b>	Daily at point source	n.a.

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

## 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
<b>Inhalation (mg/m<sup>3</sup>)</b>	115,25	950	PROC 19 results in the highest exposure in this exposure scenario
<b>Dermal (mg/kd/day)</b>	84,86	343	
<b>Combined (mg/kg/day)</b>	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.

<b>Release times per year (day/year)</b>	365	Local release to air (kg/day)	5
<b>Fraction used at main local source</b>	0.1	Local release to waste water (kg/day)	5
<b>Amount used locally (kg/day)</b>	5.5	Local release to soil (kg/day)	1
<b>Environmental exposure</b>	PEC	PNEC	<b>Comment</b>
<b>In STP / untreated wastewater(mg/l)</b>	0.34	580	-
<b>In local freshwater (mg/l)</b>	0,045	0,96	-
<b>In local soil</b>	0.0003 (mg/kg)	0,63 (mg/kgwwt)	-
<b>In local marine water (mg/l)</b>	0,0044	0,79	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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:

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

Example for calculating your local freshwater PEC:

$Corrected \text{ local freshwater PEC} = 0,045 * (\text{your local emission [kg/day]} / 5) * (2000 / \text{your local WWTP flow rate [m}^3\text{/day]}) * (18000 / \text{your local river flow rate [m}^3\text{/day]}) * ((1 - \text{your local WWTP efficiency})/0.1)$

## 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.

<b>Title: Exposure Scenario for Professional use of Ethanol in spray applications</b>		
<b>Ethanol REACH Association reference no. ES8</b>		
<b>Systematic title based on use descriptor</b>	SU22 PROC11 ERC8a, ERC8d	
<b>Processes, tasks, activities covered</b>	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.	
<b>Assessment Method</b>	Ecetoc TRA integrated model version 2	
<b>1. Exposure Scenario</b>		
<b>1.1 Operational conditions and risk management measures</b>		
<p>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;</p> <p>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.</p> <p>Number of sites using the substance: Substance widely used.</p>		
<b>1.2 Control of workers exposure</b>		
<b>Product characteristic (including package design affecting exposure)</b>	Physical state	Liquid (spray aerosol)
	Concentration of substance in product	5-25 %
	Vapour pressure of substance	5,73 kPa
<b>Amounts used</b>	n.a. in tier1 TRA model	
<b>Frequency and duration of use/exposure</b>	Frequency of exposure (weekly)	> 4 Days/week
	Frequency of exposure (annual)	300 Days/year
	Duration of exposure	Variable
<b>Human factors not influenced by risk management</b>	Potentially exposed body parts	Two hands and forearms
	Potentially exposed skin surface	1500 cm <sup>2</sup>
<b>Other given operational conditions affecting workers exposure</b>	Assumes a good basic standard of occupational hygiene is implemented.	
	Setting (indoor/outdoor)	Indoors and/or outdoors
<b>Technical conditions and measures at process level (source) to prevent release</b>	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
<b>Technical conditions and measures to control dispersion from source towards the worker</b>	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.
<b>Organisational measures to prevent /limit releases, dispersion and exposure</b>	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.	
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	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	Condition: If concentration of the substance



	resistant gloves tested to EN374) during the activities where excessive skin contact is possible.	in the product > 5 %
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### 1.3 Control of environmental exposure

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

### 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 <sup>3</sup> )	672,29	950	-
Dermal (mg/kg/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-1c, 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.

<b>Release times per year (day/year)</b>	365	Local release to air (kg/day)	n.a. wide dispersive
<b>Fraction used at main local source</b>	0.1	Local release to waste water (kg/day)	n.a. wide dispersive
<b>Amount used locally (kg/day)</b>	5.5	Local release to soil (kg/day)	n.a. wide dispersive
<b>Environmental exposure</b>	PEC	PNEC	<b>Comment</b>
<b>In STP / untreated wastewater(mg/l)</b>	0.34	580	-
<b>In local freshwater (mg/l)</b>	0,045	0,96	-
<b>In local soil</b>	0.0003 (mg/kg)	0,63 (mg/kgwwt)	-
<b>In local marine water (mg/l)</b>	0,0044	0,79	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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:

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

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 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.

<b>Title: Exposure Scenario for Consumer use of Ethanol as automotive fuel</b>		
<b>Ethanol REACH Association reference no. ES9a</b>		
<b>Systematic title based on use descriptor</b>	SU21 PC13 ERC9a, ERC9b	
<b>Processes, tasks, activities covered</b>	Covers the consumer use of automotive fuels which contain Ethanol	
<b>Assessment Method</b>	Ecetoc TRA integrated model version 2, ConsExpo v 4.1	
<b>1. Exposure Scenario</b>		
<b>1.1 Operational conditions and risk management measures</b>		
<p>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.</p> <p>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.</p> <p>Number of sites using the substance: Substance widely used.</p>		
<b>1.2 Control of consumer exposure</b>		
<b>Substance content in the product</b>	Can be > 25 %	
<b>Amounts of product used / applied per event</b>	Up to 100 litre	
<b>Exposure/release fraction</b>	0,001 (Only to vapour and minor spills during the filling of the tank)	
<b>Frequency and duration of use/exposure</b>	Frequency of exposure: weekly	
	Duration of exposure per event: < 5 minutes (only during the filling of the tank)	
<b>Setting and external conditions during use</b>	Outdoors	
<b>Technical (product related) use conditions</b>	No specific measures required.	
<b>Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer; e.g. product labelling)</b>	No specific measures required.	
<b>1.3 Control of environmental exposure</b>		
<b>Product characteristics</b>	Physical state	Liquid
	Concentration of substance in product	Can be > 25 %
<b>Amounts used</b>	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
<b>Frequency and duration of use</b>	Pattern of release	365 days per year
<b>Environment factors not influenced by risk management</b>	Flow rate of receiving surface water	18,000m <sup>3</sup> /day (default)
<b>Other given operational conditions affecting environmental exposure</b>	Processing setting (indoor/outdoor)	Outdoor
	Processing temperature	Ambient
	Processing pressure	Ambient
<b>Conditions and measures related to municipal sewage treatment plant</b>	No release into the wastewaters or sewage is expected from this use. Only environmental release from 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).	
<b>Conditions and measures related to disposal of waste resulting from the use of the products</b>	No waste expected from this use.	
<b>Conditions and measures related to recovery of waste resulting from the use</b>	n.a.	



## 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	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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.

<b>Title: Exposure Scenario for Consumer use of Ethanol as domestic fuel</b>		
<b>Ethanol REACH Association reference no. ES9b</b>		
<b>Systematic title based on use descriptor</b>	SU21 PC13 ERC8a, ERC8d	
<b>Processes, tasks, activities covered</b>	Covers the consumer use of domestic fuel products which contain Ethanol, e.g. ethanol fuel burners, fondue sets, heaters, etc. Includes garden equipment refuelling.	
<b>Assessment Method</b>	Ecetoc TRA integrated model version 2, ConsExpo v 4.1	
<b>1. Exposure Scenario</b>		
<b>1.1 Operational conditions and risk management measures</b>		
<p>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.</p> <p>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.</p>		
Number of sites using the substance: Substance widely used.		
<b>1.2 Control of consumer exposure</b>		
<b>Substance content in the product</b>	> 25 %	
<b>Amounts of product used / applied per event</b>	Up to 1 litre	
<b>Potentially exposed body parts</b>	Inside one hand: 210 cm <sup>2</sup>	
<b>Frequency and duration of use/exposure</b>	Frequency of use: weekly	
	Duration of use: 5 minutes (Only during the filling of the device)	
<b>Setting and external conditions during use</b>	Indoors and/or outdoors	
<b>Technical (product related) use conditions</b>	No specific measures required.	
<b>Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer)</b>	No specific measures required.	
<b>1.3 Control of environmental exposure</b>		
<b>Product characteristics</b>	Physical state	Liquid
	Concentration of substance in product	Can be > 25 %
<b>Amounts used</b>	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use)
	Annually total	10,000 t/year total market
<b>Frequency and duration of use</b>	Pattern of release	365 days per year
<b>Environment factors not influenced by risk management</b>	Flow rate of receiving surface water	18,000m <sup>3</sup> /day (default)
<b>Other given operational conditions affecting environmental exposure</b>	Processing setting (indoor/outdoor)	Indoor and/or outdoor
	Processing temperature	Ambient
	Processing pressure	Ambient
<b>Conditions and measures related to municipal sewage treatment plant</b>	No release into the wastewaters or sewage is expected from this use. Only environmental release from the consumer use of ethanol as domestic fuel is evaporation during filling of the burner device.	
<b>Conditions and measures related to disposal of waste resulting from the use of the products</b>	No waste expected from this use.	
<b>Conditions and measures related to recovery of waste resulting from the use</b>	n.a.	
<b>2. Exposure estimation</b>		
<b>Consumer exposure</b> 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	-	-	-
<b>Environmental exposure</b> 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
<b>Environmental exposure</b>	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	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	Negligible compared to daily dietary intake and endogenous formation.		
<b>Additional good practice advice beyond the REACH CSA</b>		Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.	
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			

**Title: Exposure Scenario for Consumer use of Ethanol in products (<50g per event)****Ethanol REACH Association reference no. ES9c**

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

**1. Exposure Scenario****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.

**1.2 Control of consumer exposure**

<b>Substance content in the product</b>	< 1 %	1 – 5 %	5 – 25 %	> 25 %
<b>Product characteristic (including package design affecting exposure)</b>	PC24, PC31	PC5, PC10, PC22, PC23, PC27, PC30, PC34	PC1, PC8, PC14, PC15, PC18,	PC3, PC28
<b>Amounts of product used / applied per event</b>	< 50 g	< 50 g	< 50 g	< 10 g
<b>Frequency and duration of use/exposure</b>	Frequency of use: Up to daily			
	Duration of use/application: up to 4 hours			
<b>Setting and external conditions during use</b>	Indoors (minimum room volume 20m <sup>3</sup> ) or outdoors			
<b>Technical (product related) use conditions</b>	n.a.	n.a.	n.a.	Controlled spray or release device.
<b>Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer; e.g. product labelling)</b>	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.

**1.3 Control of environmental exposure**

<b>Product characteristics</b>	Physical state	Liquid
	Concentration of substance in product	Could be > 25 %
<b>Amounts used</b>	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
<b>Frequency and duration of use</b>	Pattern of release	365 days per year
<b>Environment factors not influenced by risk management</b>	Flow rate of receiving surface water	18,000m <sup>3</sup> /day (default)
<b>Other given operational conditions affecting environmental exposure</b>	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
<b>Conditions and measures related to municipal sewage treatment plant</b>	Size of STP	> 2000 m <sup>3</sup> /day
	Degradation efficacy	90%
	Sludge treatment (disposal or recovery)	Disposal or recovery
<b>Conditions and measures related to</b>	No specific measures required.	

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

## 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 Ectoc 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
<b>Environmental exposure</b>	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	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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.

<b>Title: Exposure Scenario for Consumer use of Ethanol in enclosed systems</b>		
<b>Ethanol REACH Association reference no. ES9d</b>		
<b>Systematic title based on use descriptor</b>	SU21 PC16 (Heat transfer fluids), PC17 (Hydraulic fluids) ERC9a, ERC9b	
<b>Processes, tasks, activities covered</b>	Covers the consumer use of products which contain Ethanol - products in enclosed systems (with no expected exposure to ethanol during use)	
<b>Assessment Method</b>	Ecetoc TRA integrated model version 2, ConsExpo v 4.1	
<b>1. Exposure Scenario</b>		
<b>1.1 Operational conditions and risk management measures</b>		
<p>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.</p> <p>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.</p> <p>Number of sites using the substance: Substance widely used.</p>		
<b>1.2 Control of consumer exposure</b>		
<b>Substance content in the product</b>	> 25 %	
<b>Product characteristic (including package design affecting exposure)</b>	Substance is enclosed in the system and there is no consumer exposure possible under normal and reasonably foreseeable conditions of use.	
<b>Amounts of product used / applied per event</b>	n.a. substance in enclosed system	
<b>Frequency and duration of use/exposure</b>	Frequency of use: 1-5 times per year	
	Duration per use: divers	
<b>Setting and external conditions during use</b>	n.a. substance in enclosed system	
<b>Technical (product related) use conditions</b>	n.a. substance in enclosed system	
<b>Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer; e.g. product labelling)</b>	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.	
<b>1.3 Control of environmental exposure</b>		
<b>Product characteristics</b>	Physical state	Liquid
	Concentration of substance in product	Can be > 25 %
<b>Amounts used</b>	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
<b>Frequency and duration of use</b>	Pattern of release	365 days per year
<b>Environment factors not influenced by risk management</b>	Flow rate of receiving surface water	18,000m3/day (default)
<b>Other given operational conditions affecting environmental exposure</b>	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
<b>Conditions and measures related to municipal sewage treatment plant</b>	No release into the wastewaters or sewage is expected from this use. Substance is used in enclosed system during its service life.	
<b>Conditions and measures related to disposal of waste resulting from the use of the products</b>	No waste expected from this use.	
<b>Conditions and measures related to recovery of waste resulting from the use</b>	n.a.	
<b>2. Exposure estimation</b>		
<p><b>Consumer exposure</b> 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).</p>		

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	-	-		-
<b>Environmental exposure</b> 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
<b>Environmental exposure</b>	<b>PEC</b>	<b>PNEC</b>	<b>Comment</b>	
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	-	
<b>Total daily intake via local environment (mg/kgdw/d)</b>	Negligible compared to daily dietary intake and endogenous formation.			
<b>Additional good practice advice beyond the REACH CSA</b>				
<p>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</p>		<p>Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.</p>		

**Title: Exposure Scenario for Consumer use of Ethanol in coatings and paints**

**Ethanol REACH Association reference no. ES9e**

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

**1. Exposure Scenario**

**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.

**1.2 Control of consumer exposure**

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

**1.3 Control of environmental exposure**

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

**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)	21.44	n/a	-
Dermal (mg/kg/day) (chronic)	0.30	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	-	-	-
<b>Environmental exposure</b> 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
<b>Environmental exposure</b>	<b>PEC</b>	<b>PNEC</b>	<b>Comment</b>
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	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	Negligible compared to daily dietary intake and endogenous formation.		
<b>Additional good practice advice beyond the REACH CSA</b>			
<p>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</p>		<p>Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.</p>	

**Title: Exposure Scenario for Consumer use of Ethanol in antifreeze, deicing and screenwash products**

**Ethanol REACH Association reference no. ES9f**

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

**1. Exposure Scenario**

**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.

**1.2 Control of consumer exposure**

<b>Substance content in the product</b>	> 25 %
<b>Amounts of product used / applied per event</b>	1 – 50 gram
<b>Exposed skin area</b>	214 cm <sup>2</sup>
<b>Frequency and duration of use/exposure</b>	Frequency of use: weekly (up to 50 days per year)
	Duration of exposure per event: < 5 minutes
<b>Setting and external conditions during use</b>	Indoors and / or outdoors
<b>Technical (product related) use conditions</b>	Controlled spray or dosing delivery device.
<b>Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer)</b>	No specific measures required.

**1.3 Control of environmental exposure**

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

**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

Oral (mg/kg/day)	0,00	LTS 87	day of 0.25hr / event
Inhalation (mg/m3 for 24hr day)	0,51	LTS 144	
All routes systemic	-	-	
<b>Environmental exposure</b> 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
<b>Environmental exposure</b>	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	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	Negligible compared to daily dietary intake and endogenous formation.		
<b>Additional good practice advice beyond the REACH CSA</b>			
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.	

<b>Title: Exposure Scenario for Consumer use of Ethanol in washing and cleaning products</b>		
<b>Ethanol REACH Association reference no. ES9g</b>		
<b>Systematic title based on use descriptor</b>	SU21 PC35 ERC8a, ERC8d	
<b>Processes, tasks, activities covered</b>	Covers the consumer use of washing and cleaning products which contain Ethanol	
<b>Assessment Method</b>	Ecetoc TRA integrated model version 2, ConsExpo v 4.1	
<b>1. Exposure Scenario</b>		
<b>1.1 Operational conditions and risk management measures</b>		
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.		
<b>1.2 Control of consumer exposure</b>		
<b>Substance content in the product</b>	< 5%	5 – 25 %
<b>Product characteristic (including package design affecting exposure)</b>	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
<b>Amounts of product used / applied per event</b>	< 250 gram per event	< 250 gram per event
<b>Frequency and duration of use/exposure</b>	Frequency: daily use	Frequency: daily use
	Duration of exposure: 15 minutes – 1 hour	Duration of exposure: 15 minutes – 1 hour
<b>Setting and external conditions during use</b>	Indoors or outdoors	Indoors or outdoors
<b>Technical (product related) use conditions</b>	When spray application: Controlled spray or delivery device.	When spray application: Controlled spray or delivery device.
<b>Organisational consumer protection measures (e.g. recommendation and/or use instruction information for consumer)</b>	No specific measures required.	Do not spray empty in small, enclosed areas.
<b>1.3 Control of environmental exposure</b>		
<b>Product characteristics</b>	Physical state	liquid
	Concentration of substance in product	Up to 25 %
<b>Amounts used</b>	Daily at point source	n.a.
	Annually at point source	n.a. (wide dispersive use)
	Annually total	40,000 t/year total market
<b>Frequency and duration of use</b>	Pattern of release	365 days per year
<b>Environment factors not influenced by risk management</b>	Flow rate of receiving surface water	18,000m <sup>3</sup> /day (default)
<b>Other given operational conditions affecting environmental exposure</b>	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
<b>Conditions and measures related to municipal sewage treatment plant</b>	Size of STP	> 2000 m <sup>3</sup> /day
	Degradation efficacy	90%
	Sludge treatment (disposal or recovery)	Disposal or recovery
<b>Conditions and measures related to disposal of waste resulting from the use of the products</b>	No specific measures required.	
<b>2. Exposure estimation</b>		
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/m <sup>3</sup> for 24hr day)	1,73	LTS 144	
All routes systemic	-	-	
<b>Environmental exposure</b> 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
<b>Environmental exposure</b>	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	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	Negligible compared to daily dietary intake and endogenous formation.		
<b>Additional good practice advice beyond the REACH CSA</b>			
<p>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</p>		<p>Use specific measures expected to reduce the predicted exposure beyond the level estimated based on the exposure scenario when possible.</p>	

**Title: Exposure Scenario for Industrial and Professional use of Ethanol as laboratory agent**

**Ethanol REACH Association reference no. ES10**

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

**1. Exposure Scenario**

**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.

**1.2 Control of workers exposure**

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

**1.3 Control of environmental exposure**

<b>Product characteristics</b>	Physical state	liquid
	Concentration of substance in product	Up to 100 %
<b>Amounts used</b>	Daily at point source	n.a.
	Annually to the region	500 t/year
	Annually total	5,000 t/year total market
<b>Frequency and duration of use</b>	Pattern of release	Continuous 300 days per year
<b>Environment factors not influenced by risk management</b>	Flow rate of receiving surface water	18,000m <sup>3</sup> /day (default)
<b>Other given operational conditions affecting environmental exposure</b>	Processing setting (indoor/outdoor)	Indoor
	Processing temperature	Ambient
	Processing pressure	Ambient
<b>Technical conditions and measures at process level (source) to prevent release</b>	No specific onsite measures identified	
<b>Technical onsite conditions and measures</b>	No specific onsite measures identified	

to reduce or limit discharges, air emissions and releases to soil		
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 <sup>3</sup> /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.	

## 2. Exposure estimation

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

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m <sup>3</sup> )	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
<b>Environmental exposure</b>	<b>PEC</b>	<b>PNEC</b>	<b>Comment</b>
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	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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:

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

Example for calculating your local freshwater PEC:

$Corrected\ local\ freshwater\ PEC = 0,027 * (\text{your local emission [kg/day]} / 3) * (2000 / \text{your local WWTP flow rate [m3/day]}) * (18000 / \text{your local river flow rate [m3/day]}) * ((1 - \text{your local WWTP efficiency})/0.1)$

### 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.

**Title: Exposure Scenario for Industrial and Professional use of Ethanol as heat transfer fluid, or other functional fluid**

**Ethanol REACH Association reference no. ES11**

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

**1. Exposure Scenario**

**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.

**1.2 Control of workers exposure**

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

**1.3 Control of environmental exposure**

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



<b>Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	No specific measures identified. Store substance within a closed system.	
<b>Organizational measures to prevent/limit release from site</b>	Use in closed systems; no intended release into environment.	
<b>Conditions and measures related to municipal sewage treatment plant</b>	Size of STP	>2000 m <sup>3</sup> /day
	Degradation efficacy	90%
	Sludge treatment	Disposal or recovery
<b>Conditions and measures related to treatment of waste</b>	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.	

## 2. Exposure estimation

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

Workers exposure	Exposure estimate	DNEL	Comment
Inhalation (mg/m <sup>3</sup> )	38,42	950	-
Dermal (mg/kg/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.

<b>Release times per year (day/year)</b>	365	Local release to air (kg/day)	~ 0 (negligible)
<b>Fraction used at main local source</b>	0,1	Local release to sewage (kg/day)	~ 0 (negligible)
<b>Amount used locally (kg/day)</b>	5,5	Local release to soil (kg/day)	~ 0 (negligible)
<b>Environmental exposure</b>	PEC	PNEC	Comment
<b>In STP (mg/l)</b>	~ 0 (negligible)	580	-
<b>In local freshwater (mg/l)</b>	0,0107	0,96	-
<b>In local soil (mg/kg)</b>	0,0002	0,63 (mg/kgwwt)	-
<b>In local marine water (mg/l)</b>	0,0010	0,79	-
<b>Total daily intake via local environment (mg/kgdw/d)</b>	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:  
 $PEC_{corrected} = PEC_{calculated} * (local\ emission\ fraction) * (local\ WWTP\ flow\ rate\ fraction) * (local\ river\ flow\ rate\ fraction) * (local\ STP\ efficiency\ fraction)$

### 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.

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