SECTION 1. Identification of the substance / mixture and of the company / undertaking.

1.1. Product identifier:

Substance name: Windshield cleaning fluid ETA -21°C
Substance manufacturer: "CrossChem" Ltd
REACH Registration No.: Not applicable for mixtures.
CAS No.: Not applicable for mixtures.
EC No.: Not applicable for mixtures.
Index No.: Not applicable for mixtures.

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

Relevant identified uses:

PC4 – Antifreeze and de-icing products
PC21 – Laboratory chemicals;
PC35 – Washing and cleaning products;
PROC8b – Transfer of substance or mixture (charging and discharging) at dedicated facilities;
ERC2 – Formulation into mixture;
AC0 – Other.

Uses advised against: Not applicable.
Reason why uses advised against: Not applicable.

1.3. Details of the Supplier of the safety data sheet:

Manufacturer/Supplier: "CrossChem" Ltd.;
Street address/P.O. Box: "Naftaluka", Olaines pagasts, Olaines novads, LV-2127, Latvia. (Office, factory, warehouse).
National Registration No.: 40003888244
Telephone number: +371 67491030 (Administration)
E-mail: info@crosschem.lv
Homepage: https://crosschem.lv/
E-mail address of competent person, responsible for the SDS: andris.matiss@crosschem.lv

1.4. Emergency telephone number:

State Fire and Rescue Service: **(+371) 112**
Working hours: 24 hours a day, 365 days a year.

National Toxicology Center: **(+371) 67042468; (+371) 67000610**
Opening hours: Working days from 8:00 to 17:00, weekends and public holidays from 9:00 to 15:30.

Other notes: Help is provided in Latvian, Russian and English.

SECTION 2. Hazards identification.

2.1 Classification of the substance or mixture:

Classification according to Regulation (EC) No. 1272/2008 (CLP):
Flam. Liq. 3 (**H226** - Flammable liquid and vapour).

2.2 Label elements:

Labelling according to Regulation (EC) No. 1272/2008 (CLP):
According to Regulation (EC) No. 1272/2008 (CLP), product needs labelling:
H226 - Flammable liquid and vapour.

Hazard pictograms: **GHS02** – Flames.
Signal word: Wng. – Warning.

Hazard statements: **H226** - Flammable liquid and vapour.

Precautionary statements: **P102** – Keep out of reach of children;
P210 – Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking;
P233 – Keep container tightly closed;
P280 – Wear protective gloves/protective clothing/eye protection/face protection;
P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing;
P303+P361+P353 – IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

Supplemental Hazard information (EU):
If product contacts eyes, it may cause eye irritation.

2.3. Other hazards: Not applicable.

SECTION 3. Composition / information on ingredients.

3.1. Substance: Not applicable.

3.2. Mixtures:

Name of the substance	CAS No.	EC No.	REACH No.	Clasification according to (EC) No. 1272/2008.	W%/W
Water	7732-18-5	231-791-2	Not available.	Not applicable.	58 – 68 %
Ethanol	64-17-5	200-578-6	01-2119457610-43-XXXX	Flam. Liq. 2 (**H225** – Highly flammable liquid and vapour).	32 – 42 %
Surfactant	Not available.	Not available.	Not available.	Not applicable.	0.16 – 0.21 %

SECTION 4. First aid measures.

4.1. Description of first aid measures:

General information:
Remove contaminated, saturated clothing immediately. In case of accident or unwelness, seek medical advice immediately. Keep the victim calm. If the person is unconscious, place person in stable recovery position.
Consult a physician. Show this safety data sheet to the doctor in attendance.

Following inhalation:
If inhaled, remove the person to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial resuscitation (CPR). In every cases where there is doubt of person's life or if symptoms remain, seek medical advice.

Following skin contact:
Wash the affected area thoroughly with soap and plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. If irritation remains, seek medical advice.

Following eye contact:
Promptly flush eyes with water, continuing for at least 15 minutes, occasionally lifting the upper and lower eyelids, to ensure thorough rinsing. Remove contact lenses if possible and if safe to do. If irritation, redness or blinking persists, consult a doctor immediately.

Following ingestion:
If the product has been swallowed, rinse mouth with water, do not induce vomiting. Keep affected person warm and treat for shock. If the person is conscious, give him/her water to drink. Never introduce anything into the mouth of an unconscious person. If the person feels unwell, seek medical advice.

Self-protection of the first aider:
Pay attention to self protection. Comply with general hygiene requirements. Avoid inhalation of mist and vapour. Product contact with eyes is prohibited. Avoid repeated or prolonged contact with skin or clothing. Wear suitable protective clothing and gloves.

4.2. Most important symptoms and effects, both acute and delayed:

Eyes: Due to splashes of the liquid: burning/ stinging sensation. Redness of the conjunctiva, possible superficial lesions of the cornea with in general rapid reversibility.

Skin: Degreasing, dryness, later inflammation possible.

Inhalation: For very high vapor concentrations irritation to the eyes and upper airways (burning sensation to the mucous membranes, lacrimation, tussive irritation); possible bronchoconstriction.

CNS symptoms: Headache, vertigo, drowsiness, intoxication, unconsciounsness.

Increased blood pressure; changes in blood count, cardiovascular disorders; vomiting.

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

Notes to doctor:
Treat Symptomatic. Further treatment can be carried out in analogy to poisoning with alcoholic beverages. In particular, monitor the functions of the heart/ circulatory system.

SECTION 5. Firefighting measures.

5.1. Extinguishing media:

Suitable extinguishing media:
Use the most efficient and the most suitable extinguishing agent for surroundings to extinguish the fire. All standard agents are acceptable: Water spray, water fog, chemical foam, alcohol resistent foam, dry fire powder, carbon dioxide (CO_2).

Unsuitable extinguishing media: None identified.

5.2. Special hazards arising from the substance or mixture:

Hazardous combustion products:
Carbon Monoxide (CO) and Carbon dioxide (CO_2) will be formed when burning. Vapours may form explosive mixtures with air. Short-term expousures to smoke and gases may lead to irreversible lung injury without early signs of symptoms.

5.3. Advice for firefighters:

Special protective equipment for fire-fighters:
Do not enter fire area without proper protective equipment, including respiratory protection. When the potential chemical hazard is unknown, in enclosed or confined spaces, a selfcontained breathing apparatus should be worn (SCBA). During burning irritating and poisonous gases can be released, therefore use SCBA with a comprehensive facial mask, and protective fire-fighting clothing (including: fire helmet, overalls, pants, boots, gloves, eye and face protection.) must be worn.

Fire fighter's clothing conforming to European standard EN469 provides a basic level of protection for chemical incidents and includes helmets, protective boots and gloves. Clothing not conforming to EN469 may not be suitable in any chemical incident.

Use SCBA with a chemical protection suit only where personal (close) contact is likely to happen. Use SCBA with gas-tight suit when in close proximity to the substance or if its vapors is likely to arise.

5.4. Additional information:

Stay down-wind during firefighting.

Promptly isolate the scene by removing all unauthorized persons from the area of the incident if there is a fire.
A pressure increase will occur if containers are exposed to heat, therefore evaporation of solution can result in rupture of container, it may burst. Cool containers with a cold water spray. If there is no risk, move the containers away from the heat source. Shut off sources of ignition. Stop spill/release if it can be done with minimal risk. Water mist may be useful in minimizing or dispersing vapors. Beware of backfire. Ignitable mixtures may form in emptied containers. Use only explosion proved equipment. If possible, collect used extinguishing water separately, to prevent it from entering drains.

SECTION 6. Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:
Put on appropriate protective equipment (see Section 8.). Consult an emergency expert. Eliminate sources of ignition, do not smoke. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering the area. Do not touch or walk through spilled material. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. The recommendations are the same as for emergency help providing staff.

For emergency responders:
Wear appropriate protective equipment (see Section 8.), to prevent contact with the substance and inhalation of fumes or mist. Ensure to supply adequate ventilation and fresh air in closed rooms. Eliminate sources of ignition and heat. Stop leak if possible, without risk. Isolate and evacuate the danger zone, reduce the presence of persons, who are not involved in the rescue operation. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

6.2. Environmental precautions:

Avoid contact of large quantities with water courses. Do not allow large quantities of product to enter drains, surface waters, ground water, and in case of large accidental spill into the water supply, inform local authorities immediately, to stop the water supply and use. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up:

For containment:
Ensure adequate ventilation is provided. Clogging or cover drains. In the event of a major leak, stop the flow of productl by using: booms and pads, which can be found in spill kit if, it is safe to do. Scoop as much product as possible in to tight and secure containers. Absorb remains in vermiculite, dry sand, silica gel or any absorbent non-combustile material, place the used absorbent in closed, secure and suitable containers. After containing the substance, rinse the area with plenty of water.

For cleaning up:
Dispose of the material collected in secure containers according to regulations in section 13. After containing spill, clean up remains by diluting with water and mop up. In the case of small spills, wipe the surface with non-combustile absorbent material, clean surface with water afterwards.

6.4. Other information:

See Section 8 for personal protective equipment and Section 13 for waste disposal.

SECTION 7. Handling and storage.

7.1. Precautions for safe handling:

Protective measures:
Use only in dry,well ventilated areas. Handle opened container with care, close after use. Handle in accordance with good industrial hygiene and safety procedures. Avoid contact with the eyes. Avoid repeated or prolonged contact with skin. Avoid inhalation of mist. Avoid spilling or spraying in enclosed spaces. Use equipment resistant to solvents. Use appropriate protective equipment: protective clothing, gloves, goggles and respirator necessary (see Section 8.).

Measures to prevent fire:
Follow preventative fire protection regulations. Keep away from sources of spraks and ignition - No smoking. Take precautionary measures against static discharges. Use only in well ventilated areas. Work clothing that becomes wet should be immediately removed due to its flammability hazard.

Measures to prevent aerosol and dust generation:
Avoid spraying in enclosed spaces.

Measures to protect the environment:
When using a product, if a large product vapor concentration occours in enclosed areas, air ventilation systems should be equipped with activated carbon filters.

Advice on general occupational hygiene:
Provide adequate ventilation in areas where aerosol is formed. Avoid contact with eyes and skin. Provide easy access to water supply and eye wash facilities, show where to locate those.. Wash your hands with mild soap and water after use, before breaks, at the end of the working day. Do not eat, drink or smoke when using the product and in areas where product is handled, stored and processed. “NO SMOKING” signs should be placed in the working area. Regular cleaning of equipment, work area and clothing is recommended. Do not store with food, drink or animal food.

7.2. Conditions for safe storage, including any incompatibilities:

Technical measures and storage conditions:
Do not store close to heat sources, sparks or fire. Storage temperature – ambient or room temperature. Protect containers against physical damage. Containers have to be labelled clearly and permanently. Good general ventilation should be sufficient to control worker exposure to vapor. If this product exceeds exposure limits, use process enclosures: local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Packaging materials:
Suitable packing material: stainless steel, aluminium, iron, copper, nickel, glass, polyethylene terephthalate (PET), polypropylene (PP), polytetrafluoroethylene (PTFE), polyfluoroethylene (PFE), vinylidene fluorides(PVDF); high density polyethylene (HDPE); polyethylene (PE), polysulfone (PSU).

Non suitable packaging materials: Urethanes

Product can be packed in the package chosen by the buying customer, as long as it ensures safe transportation and storage of the product.

Requirements for storage rooms and vessels:
Store product protected from direct sunlight in a dry, cool and well-ventilated area. Floors must be leak-proof or covered with insulation material. It is recommended to use anti-spill container under the IBC containers or drums. Contact local authorities for further information on storage requirements.

Containers that have been opened must be carefully reinforced and kept upright to prevent leakage. Keep containers tightly closed when not in use. Keep containers protected from physical damage. Check regularly for leaks. Keep preferably in the original container. Do not remove the hazard labels of the containers (even if they are empty). Do not store in unlabeled containers.

Storage class: Storage class 3 (Flammable liquids).

Further information on storage conditions:

Product has a shelf life of 48 months, if in unopened manufacture’s packing, if stored in a cool and dry location and away from direct sunlight.

7.3. Specific end use(s):

De-icing product, windshield cleaning fluid.

SECTION 8. Exposure controls/personal protection.

8.1. Control parameters:

Components with workplace control parameters:

Component	CAS No.	Value	Control parameter	Base
Ethanol	64-17-5	OEL 8h	1000ppm; 1900 mg/m^3	Occupational health and safety requirements for exposure to chemicals at work spaces
Ethanol	64-17-5	Short term, 15 min.	1000ppm; 1900 mg/m^3	Occupational health and safety requirements for exposure to chemicals at work spaces

DNEL values of exposure to human health:

The product is aqueous ethanol solution. DNEL of the product is not determined. The physicochemical properties of the pure ethanol DNEL, which could have the most negative effect, according to REACH dossier of ethanol, is provided.

Mode of exposure	Type of exposure	DNEL value (workers)	DNEL value (public consumers)	The most negative physicochemical effect
Inhalation	Acute effect, systemic	(iii)	(iii)	Not applicable.
Inhalation	Acute effect, local	1900 mg/m^3	950 mg/m^3	Irritation (respiratory tract).
Inhalation	Chronic effect, systemic	950 mg/m^3	114 mg/m^3	Carcinogenicity.
Inhalation	Chronic effect, local	(iii)	(iii)	Not applicable.
Dermal	Acute effect systemic	(iii)	(iii)	Not applicable.
Dermal	Acute effect, local	(iii)	(iii)	Not applicable.
Dermal	Chronic effect, systemic	343 mg/kg; bw/day	206 mg/kg; bw/day	Repeated dose toxicity
Dermal	Chronic effect, local	(iii)	(iii)	Not applicable.
Through eyes	Acute effect, local	(iii)	(iii)	Not applicable.
Oral	Acute effect, systemic	(ii)	(iii)	Not applicable.
Oral	Acute effect, local	(ii)	(iii)	Not applicable.
Oral	Chronic effect, systemic	(ii)	87 mg/kg; bw/day	Repeated dose toxicity.
Oral	Chronic effect, local	(ii)	(iii)	Not applicable.
i) hazard identified but no DNEL available; ii) no exposure expected, iii) no hazard identified				

Predicted no effect contrentation values:

PNEC of the product is not determined. PNEC of pure ethanol, according to REACH dossier of ethanol, is provided.

Environmental protection target	PNEC value
Fresh water	0,96 mg/l; Periodic exposure – 2.75 mg/l
Freshwater sediments	3,6 mg/kg; Periodic exposure – PNEC value not available.
Marine water	0.79 mg/l; Periodic exposure – PNEC value not available.
Marine sediments	2.9 mg/kg; Periodic exposure – PNEC value not available.
Food chain	(ii)

Microorganisms in sewage treatment	580 mg/l; Periodic exposure – PNEC value not available.
Soil (agricultural)	0.63 mg/kg; Periodic exposure – PNEC value not available.
Air	(ii)
i) hazard identified but no PNEC available; ii) no exposure expected; iii) no hazard identified.	

8.2. Exposure controls:

Appropriate engineering controls:

Good general ventilation should be provided to control worker exposure to airborne contaminants of vapor or mists, especially in confined spaces. Adhere to good industrial hygine rules when using or handling the product. Provide access to water, hand-wash facilities and showers, as well as easy access to eye wash. Do not use tools that can generate sparks and flames, avoid static electricity, use tools that are grounded. Do not expose the container to mechanical damage.

Emissions from ventilation or work process equipment should be recommended to checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Personal protection equipment:

Eye and face protection:

Use eye and face accessories that have been tested and approved in accordance with relevant standards such as: NIOSH (US) or EN 166 (EU). It is recommended to use polycarbonate safety glasses, goggles, tightly fitting goggles or face shield.

Body protection:

Choose the type of body protection according to the situation, concentration and quantity of the hazardous substance, and the specific concentration at the workplace. Workwear must comply with EN ISO 13688 standard and special work shoes must comply with EN ISO 20347:2012 standard. It is recommended to use impervious, flame retardant and antistatic protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous product at the specific workplace.

Respiratory protection:

Where risk assessment shows, air-purifying respirators are appropriate, use a half-face or full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) or just A1 – brown colour (LVS EN 141) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and accessories tested and approved in accordance with relevant national and international standards, NIOSH (USA) or CEN (EU).

Skin protection:

Gloves should be inspected before use. Use appropriate glove removal techniques (without touching the inside of the glove) to avoid contact with the product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practice. Wash and dry your hands. The gloves used must be chemically resistant in accordance with EN 420 or EN ISO 374-1 standards. Protective gloves must be made of one of the materials, with the relevant specifications listed in the table below:

Glove material	Minimum glove thickness (mm)	Penetration time (min)	Break through time for ethanol (min)
Buthyl rubber	0.30	>480	>60
Nitrile rubber/ Nitrile latex	0.20	>480	>60
Fluorocarbon rubber	0.40	>480	>60
Polychloroprene	0.50	>480	**<60**
Natural rubber/Natural latex	0.50	>480	**<60**
Polyvinyl chloride	0.50	>480	**<60**
Neoprene	0.50	>480	>60

Please note that the penetration time of the glove material in this section has been set at 22°C and using pure Ammonium Nitrate. When working at a higher temperature, the resistance of the glove material may be considerably lower, and in such cases, the permitted life of the glove must be shortened. We recommend that when you start using a new type or other manufacturer's gloves, make sure that they are chemically and mechanically resistant to working conditions. If you have any doubt about the suitability of the gloves, please contact the suppliers of gloves.

Thermal hazards: Flammable liquid when exposed to heat or flame.

8.3. Environmental exposure controls:

Do not allow product to enter drains, surface waters or ground waters. See Section 6. for substance related measures to prevent exposure to environment.

SECTION 9. Physical and chemical properties.

9.1. Information on basic physical and chemical properties:

a) **Appearance**: Light blue liquid at 20°C and a pressure of 1013 hPa.

b) **Odour:** Ethereal, vinous and pungent odour (NIOSH Pocket Guide to Chemical Hazards. National Institute for Occupational Safety & Health. DHHS (NIOSH) Publication No. 2010-168 (2010)).

c) **Odour threshold:** 0.1 mg/L of air (Fazzalari, F.A , PA: American Society for Testing and Materials, 1978., p. 61).

d) **pH:** 7.0 to 7.29 at 20°C temp., 10 g/l conc. (GHS-Sicherheitsdatenblatt, Merck).

e) **Melting/freezing point:** -21°C to -29°C.

f) **Initial boiling point and boiling range:** 81°C to 84°C.

g) **Flash point:** 25°C to 29°C (Safety Data Sheet for Ethyl alcohol, pure. Product Number: E7023, Version 4.12, August 29, 2017.).

h) **Evaporation rate:** 5 to 8 g/h (Evaporation of the Ethanol and Water Components Comprising a Binary Liquid Mixture. K.D. O'Har', P.L. Spedding and J. Grimshaw).

i) **Flammability:** Highly flammable (Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 325-57).

j) **Upper/lower flammability or explosive limits:** Lower flammable limit (pure ethanol): 3.3% by volume; Upper flammable limit (pure ethanol): 19% by volume. Vapor may explode if ignited in an enclosed area. Upper explosion limit (pure ethanol): 27,7 vol.%; 532 g/m³. (GESTIS Substance Database).

k) **Vapour pressure:** Pure ethanol: 57.26 hPa at 19.6 - 19.65°C. (Datenbank CHEMSAFE, DECHEMA-PTB-BAM).

l) **Vapour density:** Pure ethanol: 1,59 (Sax's Dangerous Properties of Industrial Materials. 12th Edition. Wiley-Interscience, Wiley & Sons, Inc. Hoboken, NJ. 2012., p. 1983.)

m) **Relative density:** 932 to 1000 kg/m^3 (CRC Handbook of Chemistry and Physics. 95th Edition).

n) **Solubility:** Fully miscible with water . Miscible with ethyl ether, acetone, chloroform; benzene, carbon tetrachloride, ethylene glycol, glycerol, nitromethane, pyridine, and toluene. (CRC Handbook of Chemistry and Physics. 95th Edition. Boca Raton: FL 2014-2015, p. 3-246.).

o) **Partition coefficient: n-octanol/water:** (Log Kow (Log Pow)Ethanol): -0.35 at 24°C. (Hansch, C., Leo, A., D. Hoekman. Exploring QSAR - Hydrophobic, Electronic, and Steric Constants. Washington, DC: American Chemical Society., 1995., p. 3.).

p) **Auto-ignition temperature**: Pure ethanol: 363°C - 368°C at 101 325 Pa (Fire Protection Guide to Hazardous Materials. 14TH Edition, Quincy, MA 2010, p. 325-57).

q) **Decomposition temperature**: Pure ethanol: >700°C (GESTIS Substance database).

r) **Viscosity:** Pure ethanol: 1.074 mPa*s at 25°C (Haynes, W.M. (ed.). CRC Handbook of Chemistry and Physics. 95th Edition. CRC Press LLC, Boca Raton: FL 2014-2015, p. 6-232).

s) **Explosive properties:** Based to column 2 of Annex VII to the REACH Regulation, does not apply, product is not explosive. There are no chemical functional groups associated with explosive properties.

t) **Oxidising properties:** Based on column 2 of Annex VII to the REACH Regulation, does not apply, product is not oxidising. There are no chemical functional groupos associated with ozidising properties.

9.2 Other safety information: None.

SECTION 10. Stability and reactivity.

10.1. Reactivity:
Stable under regular conditions of transportation and use (see Section 7. "Handling and Storage").

10.2. Chemical stability:
Stable under storage, transportation and using conditions at low and normal ambient temperatures (-21°C to + 30°C), (see Section 7. "Handling and Storage").

10.3. Possibility of hazardous reactions:
No hazardous reaction when handled and stored according to provisions. The product may ignite if heated. Vapors may form air explosive compounds. Reaction with acids produce complex ethers and water is released (etherification reaction).

10.4. Conditions to avoid:
Avoid direct sunlight, heat, flames, sparks and incompatible materials. Do not damage product containers.

10.5. Incompatible materials:
Alkali metals; strong acids; oxidizing agents, such as chlorine, nitric acid, permanganates, bromine pentafluoride, nitrosyl perchlorate or chromate solutions; Ammonia and peroxides.

10.6. Hazardous decomposition products:
Product forms carbon monoxide (CO) and carbon dioxide (CO_2) when burnt.

SECTION 11. Toxicological information.

11.1. Information on toxicological effects:
Acute toxicity studies of the product are not available. As the product is a ethanol aqueous solution, information on acute toxicity, according to REACH dossier, is provided on ethanol.

Acute toxicity:

Effects on humans:

Routes of exposure	Exposure dose, concentration	Species	Method	Symptoms, effects	Remark
Acute oral toxicity	TDLo: 22500 mg/kg	Man	OECD 401	Changes in blood; Endocrine changes; Sleep; Headache.	PUBCHEM
Acute oral toxicity	LDLo: 2000 mg/kg	Child	OECD 401	Changes in blood; Fatty liver degradation.	PUBCHEM

Effects on animals:

Routes of exposure	Exposure dose, concentration	Species	Method	Symptoms, effects	Remark
Acute oral toxicity	LD50: 14450 - 15560 mg/kg	Rat (Ratus Norvegicus, Albino)	OECD 401	Rats that died showed severe CNS effects with death due to cardiorespiratory failure.	ECHA
Acute oral toxicity	LD50: 7060 mg/kg	Rat	OECD 401	No adverse effect observed.	TOXNET
Acute oral toxicity	LD50: 3450 mg/kg	Mouse	OECD 401	No adverse effect observed.	TOXNET
Acute oral toxicity	LD50: 6300 mg/kg	Rabbit	OECD 401	No adverse effect observed.	PUBCHEM
Acute oral toxicity	LD50: 6000 mg/kg	Cat	OECD 401	Gastritis; Hepatocelluar necrosis; Diffuse; Interstitial nephritis.	PUBCHEM
Acute oral toxicity	LD50: 5500 mg/kg	Dog	OECD 401	No adverse effect observed.	PUBCHEM

Acute inhalation toxicity	LD50: 114 mg/l	Mouse	OECD 403	Slight to moderate ataxia was observed.	ECHA
Acute dermal toxicity	LDLo: 20 g/kg	Rabbit	OECD 402	No adverse effect observed.	PUBCHEM
Acute intravenous toxicity	LD50: 2374 mg/kg	Rabbit	OECD 402	No adverse effect observed.	PUBCHEM
Acute intravenous toxicity	LD50: 3945 mg/kg	Cat	OECD 402	No adverse effect observed.	PUBCHEM
Acute intravenous toxicity	LD50: 1973 mg/kg	Mouse	OECD 402	No adverse effect observed.	PUBCHEM
Acute intravenous toxicity	LD50: 1440 mg/kg	Rat	OECD 402	Functional dyspnea.	PUBCHEM

Other information: No data available.

Assessment / Classification:

After studying all the routes of exposure, ethanol is considered as very low toxic substance. According to CLP, the substance is not considered to make acute toxicity and does not meet the criteria for classification.

Skin corrosion/irritation:

Effects on humans:

Exposure dose, concentration	Exposure time	Observation time	Species	Method	Symptoms, effects	Remark
0.2ml of ethanol	Once a day for 21 days.	Daily for 21 days.	Male humans	OECD 427	No irritation was seen until day 13, after which the irritative response slowly increased, initially as erythema until by day 19.	ECHA

Effects on animals: No data available.

Other information: Slightly irritating under extreme repeat dose situations. There is a considerable history of dermal application of ethanol as an antiseptic with no concern for skin irritancy.

Assessment / Classification:

Following the studied routes of exposure, product is not classified as a skin corrosive / irritant.

Serious eye damage/irritation:

Effects on humans: No data available.

Effects on animals:

Exposure type	Exposure time	Observation time	Species	Method	Symptoms, effects	Remark
Single injection of 0.1 ml	Single application	72h	Rabbit (New Zealand white)	OECD 405	Immediate moderate redness.	ECHA; PUBCHEM

Other information: Following direct contact with the eye, ethanol causes burning/shooting pain. Splashes of 40 to 50% ethanol solution produce reddening and superficial lesions which, however, are rapidly disappeared.

Assessment / Classification:

Ethanol can be classified as irritating to the eyes.

Respiratory or skin sensitisation:

Effects on humans: No data available.

Effects on animals: No data available.

Other information: No adverse effect observed (not sensitising).

Alcohol vapor exposure at sufficiently high concentrations may cause prompt cough, headache, fatigue, drowsiness, burning sensation but there appear to be no reports of lung damage from industrial exposure to alcohol vapors.

***Assessment / Classification**:*

Studies indicate that ethanol is not a sensitive substance for skin or respiratory system.

Germ cell mutagenicity:

Effects on humans: No data available.

Effects on animals:

Exposure dose, concentration	Exposure time	Obserbvation time	Species	Method	Symptoms, effects	Remark
10 mg/plate.	Preincubation period: 20 mins at 37°C.	Expression time (cells in growth medium): 2 days at 37°C.	S.typhimurium TA.	OECD 471	Ethanol failed to induce DNS reversions in any of S. typhimurium tester strain	ECHA

Other information: Mutagenic effects of ethanol were definitely determined in animal experiments however, the corresponding dosages were already distinctly toxic, under these conditions, the germ cell-mutagenic potential is considered to be negligible.

***Assessment / Classification**:*

Based on the results of the "Ames" study with different concentrations of ethanol on bacteria, it was interpreted that ethanol does not exhibit mutagenic effects.

Carcinogenicity:

Effects on humans: No data available.

Effects on animals:

Exposure dose, concentration	Exposure time	Obserbvation time	Species	Method	Symptoms, effects	Remark
LDLo:320 mg/kg	Not stated.	Not stated.	Mouse	OECD 451	Gastrointestinal: Tumors; Liver: Tumors	PUBCHEM

Other information: Confirmed animal carcinogen with unknown relevance to humans. Long-term intake of large amounts of ethanol in the form of alcoholic beverages could cause tumors in the oral cavity/pharynx, larynx, gullet, liver and probably also in the breast and bowels. (Toxikologisch-arbeitsmedizinische Begründungen von MAK-Werten; Verlag Chemie).

***Assessment / Classification**:*

No classification is proposed for carcinogenicity.

Reproductive toxicity:

Effects on humans: No data available.

Effects on animals:

Exposure dose, concentration	Exposure time	Obserbvation time	Species	Method	Symptoms, effects	Remark
Orally: 5, 10 and 15% v/v in water	Once a day for 13 weeks	18 weeks	Mouse	OECD 416	No observed effect on fertility.	ECHA

Other information: No data available.

***Assessment / Classification**:*

Professional, primary or secondary exposure of ethanol is unlikely to affect fertility. Based on available data, the classification criteria are not met.

Summary of evaluation of the CMR properties:

Effects on Humans: No data available.

Effects on animals:

Exposure dose, concentration	Exposure time	Obserbvation time	Species	Method	Symptoms, effects	Remark
Inhalation: 17, 29 and 28 g/kg bodweight	7 hours per day	19 days	Rats	OECD 414	No teratogenic effects, No definite evidence of malformations due to ethanol exposure were seen.	ECHA; PUBCHEM

Other information: No data available.
Assessment / Classification:
Ethanol does not meet the criteria for classification as mutagenic for reproduction category 1A or 1B (CLP).

STOT-single exposure:

Effects on humans: No data available.
Effects on animals: No data available.
Other information: No data available.
Assessment / Classification:
Based on available data, the classification criteria are not met.

STOT-repeated exposure:

Effects on humans: No data available.
Effects on animals:

Exposure dose, concentration	Exposure time	Obserbvation time	Species	Metho d	Symptoms, effects	Remark
Orally, in nominal diet of 5% w/v in deionized water.	Once a day	90 days	Mouse (B65C3F1)	OECD 414	Sperm count in the cauda epididymis was decreased (~30%)	ECHA; PUBCHEM
Inhalation dose: 6130 ppm ethanol	6 h/day and 5 days/ week.	4 weeks	Rats	OECD 410	Exposure to ethanol resulted in some slight brain neurochemical alterations that were gender-specific.	ECHA

Other information: No data available.
Assessment / Classification:
Dose toxicity was not observed in any of the studies. Based on available data, the classification criteria are not met.

Aspiration hazard:

Effects on humans: No data available.
Effects on animals: No data available.
Other information: No data available.
Assessment / Classification: Based on available data, the classification criteria are not met.

SECTION 12. Ecological information.

12.1 Toxicity:
Studies of ecological impact of the product are not available. As the product is ethanol aqueous solution, information about ecological impact, according to REACH dossier, is provided of ethanol.

Acute (short-term) toxicity:

Target parameter	Value	Species	Method	Exposure time	Remark
LC50	14 200 mg/L	Freshwater fish - Pimephales promelas	OECD 203	96 h	ECHA

LC50	5012 mg/L	Aquatic invertebrates - Daphnia magna	OECD 202	48 h	ECHA
LC50	857 mg/L	Marine invertebrates	-	-	ECHA
EC50	275 mg/L	Freshwater algae	OECD 201	48 h	ECHA
LC50	8140 mg/L	Freshwater algae - Chlorella Vulgaris	OECD 201	48h	ECHA
EC50	1.9 – 1.97 g/L	Marine algae	-	-	ECHA
IC50	> 1 000 mg/L	Microorganisms - sludge	OECD 209	3 h	ECHA
LC50	<1000 mg/cm^2	Earthworms	OECD 207	48 h	ECHA
EC50	4.432 g/L	Freshwater plants	-	-	ECHA
EC50 / LC50	633 mg/kg soil dw	Terrestrial plants	OECD 208	-	ECHA
LC50	27 mg/L	Artemia franchiscana (Brine shrimp)	-	48 h	TOXNET

In general ethanol is of low toxicity to living organisms. And it is not classified as toxic to the environment according to the classification system of the EU (CLP). It's a simple aliphatic alcohol occurring everywhere in nature and most organisms are capable of metabolising it. Birds are not likely to be exposed to ethanol of anthropogenic origin. Some birds are by the way regularly exposed to ethanol when eating riped fruit. Ethanol is fully miscible with water/will not bioaccumulate in soil (organic matter) or in living organisms. Furthermore ethanol is a VOC. Accordingly any spillage onto the soil will tend to evaporate into the air and be diluted by soil water. Ethanol is only sligtly toxic to the green algae Chlorella vulgaris.

Chronic (long-term) toxicity:

Target parameter	Value	Species	Method	Exposure time	Remark
EC10/LC10	250 mg/L	Freshwater fish	OECD 204	14 days	ECHA
LC50	454 mg/L	Water invertebrates - Daphnia magna	OECD 211	10 days	ECHA
EC10/ LC10	79 mg/l	Marine invertebrates	-	-	ECHA

Not required - ethanol has a very low short-term toxicity to fish. Furthermore ethanol is fully miscible with water/will not bioaccumulate. Ethanol is practically non-toxic to aquatic invertebrates based on survival.

12.2. Persistence and degradability:

Biodegradation:

BOD5 1.067 - 1.236 g O_2/g test material - Biochemical Oxygen Demand is the amount of dissolved oxygen needed by aerobic biological organisms to break down organic material present in a given water sample.
COD 1.99 g O_2/g test material - Chemical Oxygen Demand, is a measure of the total quantity of oxygen required to oxidize all organic material into carbon dioxide and water.

According to BOD5 and COD valueas ethanol is expected to be readily biodegradable and will not bioaccumulate in water, water sediments and soil.

Vapor-phase ethanol will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 5 days. Ethanol is not expected to undergo hydrolysis in the environment due to the lack of functional groups that hydrolyze under environmental conditions.

Aerobic:

Ethanol, at 100 mg/L, completely degradeds in 5-8 days in aerobic microorganisms. Ethanol rapidly degradeds in soil forming formaldehyde and acetic acid along with carbon dioxide and water. When released into soil or groundwater, it is biodegradable, 74% biodegradable in 5 days and 95% degradable in 15 days.

Anaerobic:

Ethanol at 100 mg/L, Ethanol rapidly degradeds in anaerobic microcosms prepared from low organic (0.2% organic carbon) sandy aquifer material and ground water at pH 5.2 with a half-life of approximately 1.5 days

***Other information*:**

For the results of studies of biodegradation of ethanol, see TOXNET, ECHA and PUBCHEM.

12.3. Bioaccumulative potential:

Partition coefficient n-octanol /water (log Kow):

-0.35 (24°C). Considered to be low (based on high solubility in water). The main part of product – ethanol – does not have any bio accumulative properties, does not form any toxic compounds with other substances present in the air or drainage waters.

Bioconcentration factor (BCF):

Species	Exposure time	Method	Result value	Remark
Fish - Leuciscus idus melanotus	72 h	OECD 305	BCF = 3	TOXNET

Bioconcentration factor and low partition coefficient suggests the potential for bioconcentration in aquatic organisms is low.

12.4. Mobility in soil:

Known or predetermined prevalence in environmental compartments:

If substance is released to environment it will end up:

Air	12.5 - 73.3 %
Water	15.6 - 87.5 %
Soil	0 - 11.1 %
Sediment	0 - 0.02 %
Suspended sediment	0 %
Biota	0 %
Aerosol	0 %

Surface tension: 30.15 to 33.53 mN/m at 20°C.

Adsorption / Desorption:

Spreading environment	Mode of transport	Method	Result value (pure ethanol)	Remark
Soil - water	Absorbption	OECD 106	*Koc*: 0.20	TOXNET

This Koc value suggests that ethanol is expected to have very high mobility in soil.

12.5. Results of PBT and vPvB assessment:

In accordance with Regulation (EC) No 1907/2006, Annex XIII, ethanol does not meet the PBT and vPvB criteria and is not a PBT or vPvB substance.

12.6. Other adverse effects:

None.

12.7. Additional information:

No data available.

SECTION 13. Disposal considerations.

13.1 Waste treatment methods:

Product / Packaging disposal:

In accordance to annex III of "Commission notice on technical guidance on the classification of waste" **(2018/C 124/01)**, the product, without any impurities, is classified as hazardous waste by **HP3**.

In accordance to Commission decision **(2014/955/EU)** and Republic of Latvia Cabinet of Ministers Regulation **No. 302**, the product, without any impuritiues, is classified as hazardous waste (see EWC codes).

Dispose of collected material as unused material. Burn in a chemical incinerator equipped with an afterburner and scrubber, but take extra care in igniting gas, this material is highly flammable. Contact nearest waste disposal facility for further instructions.

Collection of small amounts of products: Place in a collection container for halogen-free organic solvents and halogen-free organic solutions. Collection vessels must be clearly labelled with a systematic description of their contents. Store the vessels in a well-ventilated location away from direct exposure of sun.

Empty the product cans or drums, free them from as much of the product as possible. The packing needs to be cleaned. In accordance with Regulation (EC) No. 1357/2014, empty packaging, clean from product, is not classified as hazardous waste. Re-use or dispose clean packing material.

If packing contains product or is contaminated, or if packing cannot be cleaned, dispose of it as unused product.

Dispose of product and its packaging safely in accordance with regional and national environmental regulations.

Waste codes / waste designations according to EWC:

According to the European Waste Catalog (EWC) and European List of Waste (LoW), the applicable codes for product are:
07 01 01 – Aqueous washing liquids and mother liquors (AH – absolute hazard);
07 01 04 – Other organic solvents, washing liquids and mother liquors (AH – absolute hazard);
15 01 02 – Plastic packaging (AN – absolute non hazardous);
16 10 02 – Aqueous liquid waste other than those mentioned in 16 10 01 (MN – Mirror, non-hazardous);
20 01 13 – Solvents (AH – absolute hazard).

Sewage disposal-relevant information:
Waste should not be disposed of by release into sewers.

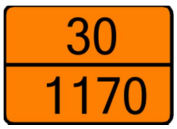
Other disposal recommendations:
It is the responsibility of the waste treatment company to make a final decision on the relevant waste management, disposal or recycling method in accordance with regional, national or European legislation and possible adaptation to local conditions.

SECTION 14. Transport information.

ADR	IMDG	ICAO-TI/IATA-DGR	ADN	RID
14.1. UN Number:				
1170	1170	1170	1170	1170
14.2. UN proper shipping name:				
ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	ETHYL ALCOHOL SOLUTION	ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)	ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)
Transport document description:				
UN 1170 ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION), 3, III, (D/E)	UN 1170 ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION), 3, III	UN 1170 ETHYL ALCOHOL SOLUTION, 3, III	UN 1170 ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION), 3, III	UN 1170 ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION), 3, III
14.3. Transport hazard class(es):				
3	3	3	3	3

				
14.4. Packing group:				
III	III	III	III	III
14.5. Environmental hazards:				
Dangerous for the environment: No	Dangerous for the environment:: No Marine pollutant: No	Dangerous for the environment: No	Dangerous for the environment: No	Dangerous for the environment: No

14.6. Special precautions for users:



Road transport (ADR):

Oragne plates: If carrying >1000 L at once, apply orange plates.
Classification code: F1
Special provisions: 144, 601
Limited quantities: 5 L
Excepted quantities: E1
Packing instructions: P001, IBC03, R001, LP01
Mixed packing provisions: MP19
Portable tank and bulk container instructions: T2
Portable tank and bulk container special provisions: TP1
Tank code: LGBF
Vehicle for tank carriage: FL
Special provisions for carriage – Operation: S2, S20
Special provisions for carriage – Packages: V12
Hazard identification number (Kemler No.): 30
Tunnel restriction code: 3 (D/E)
HAZCHEM CODE: 2YE

Transport by sea (IMDG):

Special provisions: 144, 223, 330
Limited quantities: 5 L
Excepted quantities: E2
Packing instructions: P001, LP01
IBC packing instructions: IBC03
Imo tank instructions: T1
UN tank instructions: T4
Tank special provisions: TP
EmS-No.: F-E; S-D
Stowage category: A
Properties and observations: Colourless, volatile liquids. Pure ETHANOL: flashpoint 13°C c.c. Explosive limits: 3.3% to 19%. Miscible with water.

Air transport (IATA)

PCA Excepted quantities: E2
PCA Limited quantities: Y344
PCA Limited quantity max net quantity: 10 L
PCA packing instructions: 355
PCA max net quantity: 60 L
CAO packing instructions: 310
CAO max net quantity: 220 L
Special provisions: A3, A58, A180

ERG code: 3L

Inland waterway transport (ADN):

Classification code:	F1
Cargo tank design:	3
Cargo tank type:	2
Maximum degree of filling in %:	97
Type of sampling device:	3
Pump room below deck permitted:	yes
Temperature class:	T2
Explosion group:	IIB (IIB1)
Anti explosion protection required:	yes
Equipment required:	PP, EX, A
Number of blue cones/lights:	0
Special provisions:	144, 601
Limited quantities:	5 L
Excepted quantities:	E1
Carriage permitted:	T
Ventilation:	VE01

Rail transport (RID):

Classification code:	F1
Special provisions:	144, 601
Limited quantities:	5 L
Excepted quantities:	E1
Packing instructions:	P001, IBC03, LP01, R001
Mixed packing provisions:	MP19
Portable tank and bulk container instructions:	T2
Portable tank and bulk container special provisions:	TP1
Tank codes for RID tanks:	LGBF
Transport category:	3
Special provisions for carriage – Packages:	W12
Colis express (express parcels):	CE4
Hazard identification number:	30

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:

Not applicable.

SECTION 15. Regulatory information.

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

EU regulations:

- Regulation (EC) **No. 1907/2006** of the European Parliament and Council of 18. December 2006 on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH);
- Commission Regulation (EU) **2015/830** of 28 May 2015 amending Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH);
- Commission regulation (EU) **No. 552/2009** of 22 June 2009 amending Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards Annex XVII;
- Regulation (EC) **No. 1272/2008** - classification, labelling and packaging of substances and mixtures (CLP);
- Commission regulation (EU) No. **1357/2014** of 18 December 2014 replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives;
- Regulation **649/2012/EU** concerning the export and import of hazardous chemicals (PIC);
- Regulation **850/2004/EC** on persistent organic pollutants (POP);

- Seveso III Directive **2012/18/EU** - Technological Disaster Risk Reduction;

No.	Dangerous substance/ hazard categories	Qualifying quantity (tonnes) for the application of lower and upper-tier requirements	
P5c	flammable liquids (cat. 2, 3)	5.000	50.000

- European Agreement concerning the International Carriage of Dangerous Goods by Road **(ADR**);
- European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (**ADN**).
- Commission notice on technical guidance on the classification of waste **2018/C 124/01**;
- Directive **2008/98/EC** of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives;
- Regulation (EC) **No. 166/2006** of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC;
- Regulation (EC) **No. 648/2004** of the European Parliament and of the Council of 31 March 2004 on detergents;
- **2014/955/EU:** Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament and of the Council.

International regulations:

- Regulations concerning the International Carriage of Dangerous Goods by Rail (**RID**);
- International Maritime Dangerous Goods Code (**IMDG**);
- International Convention for the Prevention of Pollution from Ships (**MARPOL 73/78**);
- Internationall Aviation Transport Association regulations **(IATA)**;
- International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (**IBC Code**).

National regulations (Latvia):

- Chemical Substances Law;
- Republic of Latvia Cabinet of Ministers Regulation **No. 795**: "Procedures for Registration of Chemical Substances and Mixtures and Their Database";
- Republic of Latvia Cabinet of Ministers Regulation **No. 325**: "Labour Protection Requirements when Coming in Contact with Chemical Substances at Workplaces";
- Republic of Latvia Cabinet of Ministers Regulation **No. 302:** "Provisions regarding the waste classification and the characteristics rendering the hazardous waste";
- Republic of Latvia Cabinet of Ministers Regulation **No. 107**: "Procedure for Classification, Labeling and Packaging of Chemicals and Chemical Products";
- Labour Protection Law;
- **LVS EN 149 + A1:2009** - Standard for disposable dust respirators with or without valve according to which they are labeled with FFP1, FFP2 or FFP3 depending on protection class;
- **LVS EN 143:2002 + AC/AC:2005** - Standard for dust filters P1, P2, P3 for use with half masks and full face masks;
- **LVS EN 141:2002** - Standard for gas and combined filters;
- **LVS EN 14387:2004+A1:2008** - Respiratory protective devices. Gas filter(s) and combined filter(s). Requirements, testing, marking;
- **EN 420**: The standard of glove safety;
- **LVS EN 388** - "Protective gloves against mechanical effects";
- **EN469** - Protective clothing for firefighters - Requirements for firefighting protective clothing;
- **LVS EN ISO 374-1** - "Protective gloves against dangerous chemicals and microorganisms";
- **LVS EN 166:2002** - "Individual eye protection. Specifications ";
- **LVS EN ISO 13688** - "Protective clothing - General requirements;
- **LVS EN ISO 20347:2012** - "Personal protective equipment - Occupational footwear"

15.2. Chemical safety assessment:

No chemical Safety Assessment has been carried out for this mixture.

SECTION 16. Other information.

16.1. Indication of changes:

Release Date: **08.05.2011.**
Date of revision: **22.07.2019.**
Version: **2.0.**

16.2. List of abbreviations and acronyms used throughout the Safety Data Sheet:

CPR – Artificial respiration or cardiopulmonary resuscitation;
SCBA – Self-contained breathing apparatus;
OEL – Occupational exposure limit;
DNEL – Derived njo effect level;
PNEC – Predicted no effect contrentation;
STOT – Specific target organ toxicity;
CMR – Carcinogenic, mutagenic and reprotoxic chemicals;
LD50 – Median lethal dose;
LDLo – Lowest lethal dose;
TDLo – Lowest published lethal dose;
EC50 – Half maximal effective concentrtation;
LC10 – Lethal dose at which 10% of the test population are killed;
EC10 – Effective concentration at which it is expected 10% of the test organisms would show an adverse effect;
LC50 – Median lethal concentration;
LD100 – 100% lethal dose;
PBT/ vPvB – Persistent, bioaccumulative and toxic and very persistent and very bioaccumulative;
OECD – Organisation for Economic Co-operation and Development;
ppm – parts per million;
bw – body weight;
BCF - Bioconcentration factor;

16.3. Key literature references and sources for data:

Toxnet, Pubchem, ECHA.