Material Safety Data Sheet

According to Regulation (EC) No 1907/2006

Product name: **Auswaschmittel E90**

Revision : 14.03.2022 Version 4 in accordance with (EU) 2020/878

[= Marking of modifications to the previous version

SECTION 1: Identification of the mixture and of the company

1.1 Product identifier

Product name: **Auswaschmittel E90**

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

Denatured ethanol is used in a wide variety of applications, both chemical and technical.
Uses being advised against: no specific uses known.

1.3 Details of the supplier of the safety data sheet

Manufacturer / supplier:	Teca-Print AG
Street / post box:	Bohlstrasse 17
Postal code / city:	CH-8240 Thayngen
Phone:	+41 (0) 52 645 20 00
Enquiries about the safety data sheet:	info@teca-print.com

1.4 Emergency telephone number

National emergency number:	**145**
Tox Info Swiss, Zürich, for inquiries from Switzerland; DE, FR, EN, IT	available 24h/7d
Tox Info Swiss, Zürich, for inquiries from outside of Switzerland:	+41 (0)44 251 51 51

SECTION 2: Hazards identification

According to the definition of the regulation (EC) No 1907/2006, denatured ethanol is considered as a mixture

2.1 Classification of the substance or mixture

Flam. Liq. 2; GHS02; H225 Highly flammable liquid and vapour.
Eye Irrit. 2; GHS07; H319 Causes serious eye irritation (at concentrations above 50 %)

2.2 Label elements

Pictograms:

GHS02, Flame: 

GHS07, Exclamation mark: 

Signal word: Danger

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

Precautionary statements:
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233 Keep container tightly closed.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P243 Take Precautionary measures against static discharge.
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.

2.3 Other hazards

Ethanol doesn't meet the criteria for vPvB and/or PBT classification according to the regulations (EC) No 1907/2006, Annex XIII.
EUH018: In use may form flammable/explosive vapour-air mixture.
Ethanol has no endocrine disrupting properties.

SECTION 3: Composition/information on ingredients

3.1 Substances: According to the definition of the regulation (EC) No 1907/2006, denatured ethanol is considered as a mixture.

3.2 Mixtures
Description: Mixture of the substances listed below:

ETHANOL

REACH registration number:	01-2119457610-43-0098
EC number:	200-578-6
CAS number:	64-17-5
Index number:	603-002-00-5
Per cent content:	ca. 92 % m/m
Classification according to the regulation (EC) No 1272/2008:	Flam. Liq. 2; GHS02; H225 Eye Irrit. 2; GHS07; H319 Signal word: Danger

METHYL ETHYL KETONE (MEK); 2-BUTANONE

Registration number:	01-2119457290-43-xxxx
EC number:	201-159-0
CAS number:	78-93-3
Per cent content:	2 % m/m
Classification according to the regulation (EC) No 1272/2008:	Flam. Liq. 2; GHS02; H225 Eye Irrit. 2; GHS07; H319 STOT SE 3; GHS07; H336 Signal word: Danger

Water content: ca. 5.8 % m/m

For the wording of the abbreviations used in sections 2 and 3, refer to section 16.

SECTION 4: First aid measures

4.1 **Description of first aid measures**
In case of disturbances / health disorders and in all doubt when symptoms persist get medical advice.
Inhalation
Move affected person to fresh air. In case of irritation of the respiratory tract, seek medical attention.
In case of unconsciousness place patient stably in side position for transportation.
Skin contact
Immediately remove contaminated clothing. Immediately rinse with water.
If skin irritation continues, consult a doctor.
Eye contact
IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
Ingestion
Immediately wash out mouth with water and drink about 2 glasses of water.
Do not induce vomiting; call for medical help immediately. Never give anything by mouth to an unconscious person.
In case of spontaneous vomiting, be sure that vomit can freely drain because of danger of suffocation.

4.2 **Most important symptoms and effects, both acute and delayed**
Headache, dizziness, unconsciousness, nausea.
Contact with eyes causes severe irritation.

4.3 **Indication of any immediate medical attention and special treatment needed**
In case of unconsciousness: call a physician on emergency duty.

SECTION 5: Firefighting measures

5.1 Extinguishing media
CO2, powder or water spray.
Fight larger fires with water spray and alcohol-resistant foam.
Unsuitable extinguishing agents for safety reasons: straight stream of water.

5.2 Special hazards arising from the product
Mixtures of vapours with air which may explode when ignited, may be formed at room temperatures as low as 9 °C.
The vapours are heavier than air and may accumulate in low or confined areas (danger of explosion).
The vapours may spread along the ground and travel a considerable distance to a source of ignition and flash back.
Runoff to sewer may create fire or explosion hazard.
Burning will produce black fumes and dangerous gases: carbon monoxide and carbon dioxide.
In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

5.3 Advice for firefighters
Keep unprotected persons away. Do not inhale smoke, combustion gases an vapours.
For fighting fire, self contained breathing apparatus and full protective clothing must be worn.
Cool endangered containers from a safe distance with a water spray.
Do not allow extinguishing water enter sewers, surface or ground water or the soil.
Wear suitable protective clothing and keep a safe distance in order to prevent skin contact.

5.4 Information about the explosion properties of the mixtures of ethanol vapours with air
Refer to sections 9.1 and 9.2.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Wear protective measurements as described in sections 7 and 8. Keep unprotected persons away.
Ensure adequate ventilation. Don't inhale vapours.
In case of unsufficient ventilation, use respiratory protective device (according to section 8.2.2).
Improvised equipment for ventilation and illumination must be explosion proof.
Remove sources of ignition. Take precautionary measures against electrostatic discharges. Don't smoke.
Prevent vapours from entering into drainage system, pits or cellars (danger of explosion).
Use personal protective measurements mentioned in sections 7.1 and 8.2.2.

6.2 Environmental precautions
Stop leak if possible without risk.
Prevent contamination of soil, drains and surface water.
If larger quantities are handled, keep preventively available material for containment.
Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up
Ensure adequate ventilation. Use only spark-proof tools and explosion-proof equipment.
Do not flush with water or aqueous detergents. Keep material for cleaning up available.
Take-up spillage with absorbent, inert material (sand, diatomite, acid binders, universal binders, sawdust)
and collect in suitable and closable, labelled containers for recovery or disposal.
Attention: Absorbent material and also cleaning rags soaked with ethanol are extremely flammable.
If the dispersed liquid has to be pumped away, use only explosion proof pump or aspirator!
Usually the collected material may be disposed of with the approval of the competent authorities in a waste treatment plant.
Otherwise dispose of according to section 13.

6.4 Reference to other sections
Information about safe handling, see section 7.
Information about personal protective equipment, see section 8.2.2
Information about disposal, see section 13.

SECTION 7: Handling and storage

Warning: Uncleaned "empty" container may contain a vapour-air mixture, being highly explosive.
Never drill, cut, grind, solder, braze, and weld etc. near to or at an "empty" container.
Never give away "empty" drums to an employee or other private person.

7.1 Precautions for safe handling
Critical properties of ethanol
Ethanol is highly flammable! Explosive vapour-air mixtures may be formed already at room temperature.
The vapours are heavier than air and may accumulate in low or confined areas (danger of explosion).
Ethanol tends to get electrostatically charged.

Precautionary measures
Keep containers always closed. Avoid inhalation of vapours or aerosols. Eliminate all sources of ignition.
Provide adequate general and local exhaust ventilation at the work place. Use only non-sparking tools.
Ensure adequate ventilation/exhaust ventilation also at ground level (vapours are heavier than air).
Take all safety measures being standard for the handling of highly flammable solvents, e.g.:

ATEX conform mobile electrical equipment and installations for lightning, ventilation and handling.
Ground and bond containers and transfer equipment to eliminate accumulation of static charge.
Wear shoes with conductive soles. Ensure adequate conductivity of the floor (no plastic foils or non conductive contamination).
Never transport ethanol with compressed air. For pumping use only explosion proof pumps.
Take the protective measures against chemical exposure according to section 8.2.
Wear safety goggles. At the work place an emergency eye wash station must be available.
Do not eat, drink or smoke in the work place.

7.2 Conditions for safe storage, including any incompatibilities

Information about fire and explosion prevention

Explosive vapour-air mixtures may be formed already at room temperature (above 9 °C).
Spillages will create a fire hazard. Explosive vapours are heavier than air.
Prevent vapours from entering into sewage systems, pits or cellars.
Prevent heat/sparks/open flames/hot surfaces. – No smoking.
Take precautionary measures against static discharge. Wear shoes with conductive soles etc.
Use explosion proof equipment/installations and spark proof tools.
Keep away from oxidizing and other incompatible materials as mentioned in section 10.3.

Information about the storage conditions

Use only spark proof tools and explosion proof electrical equipment/installations for handling, illumination, ventilation etc.
Store at 5-30 °C in securely closed containers (ethanol is hygroscopic), outdoors or in a dry,
well ventilated, explosion proof room with solvent resistant, tight floor. Protect from heat and sunlight.
Store only in original containers or receptacles specifically permitted for ethanol (ethanol corrodes aluminium!).
Prevent access of unauthorised persons.

Mixed storage

Storage class of VCI (Germany): 3 (Flammable liquids)
Keep away from food, beverages and animal feed.
Do not store together with oxidizing, acidic or other materials not being compatible with substances of storage class 3.

Stored quantity limits

In Switzerland quantity limits in function of the kind of building/storage rooms and the flash point are given by the Vereinigung Kantonaler Feuerversicherungen VKF, 3001 Bern: "Brandschutzrichtlinie/Gefährliche Stoffe" (26-15de)
The quantity limit for the submission under the Swiss Major Accidents Ordinance is 20 000 kg.

7.3 Specific end uses

Denatured ethanol is used in a wide variety of chemical and technical applications.

SECTION 8: Exposure controls/personal protection

8.1 **Control parameters (Swiss exposure limits 2021)**

ETHANOL (CAS-No.: 64-17-5)	
Short term value (STEL, 4 x 15 minutes):	1920 mg/m3, 1000 ml/m3
Long term value (8 hour TWA):	960 mg/m3, 500 ml/m3
Notes:	
C: pregnancy group C (no effect on foetus if exposure limits are not exceeded)	

METHYL ETHYL KETONE;	CAS number: 78-93-3
Short term value (STEL, 4 x 15 minutes):	590 mg/m3, 200 ml/m3
Long term value (8 hour TWA):	590 mg/m3, 200 ml/m3
Notes:	
[B: BEI value (sampling of urine at the end of the exposure):	2 mg/l
C: pregnancy group C (no effect on foetus if exposure limits are not exceeded)	
H: possibility of intoxication by absorption through the skin	

[European indicative limit values (according to the applicable EU directives up to (EU) 2019/1831)

91/322/EWG, 2000/39/EG, 2006/15/EG, (EU) 2017/164, (EU)2017/2398, (EU) 2019/130, (EU) 2019/983, (EU) 2019/1831

METHYL ETHYL KETONE;	CAS number: 78-93-3
Short term value (STEL):	900 mg/m3, 300 ml/m3
Long term value (8 hour TWA):	600 mg/m3, 200 ml/m3

DNEL and PNEC values of ETHANOL

DNEL = Derived no effect level (concentration or dose, below which no effects on humans is to be expected)
PNEC = Predicted no effect concentration (concentration, below which no effects on the environment is to be expected)
Exp-F = Extrapolation factor

[	**DNEL values**	**Toxicity values for the work place:**
	(More complete DNEL data are found in section 11)	
	Systemic toxicity effects, acute inhalation	no hazard identified
	Systemic toxicity effects, chronic, dermal	DNEL = 343 mg/kg per day
	Systemic toxicity effects, chronic, inhalation	DNEL = 950 mg/m3

[	**PNEC-Values (ethanol)**	**Effects on the environment:**
	Freshwater organisms, continuous liberation	PNEC = 0.96 mg/l; (Exp-F = 10)
	Seawater organisms, continuous liberation	PNEC = 0.79 mg/l; (Exp-F = 100)
	Freshwater sediment microorganisms	PNEC = 3.6 mg/kg sediment; (no Exp-F)
	Seawater sediment microorganisms	PNEC = 2.9 mg/kg sediment; (no Exp-F)
	Land microorganisms	PNEC = 0.63 mg/kg soil; (Exp-F = 1000)
	Freshwater organisms, intermittent release	PNEC = 2.75 mg/l
	Sewage treatment plant microorganisms	PNEC = 580 mg/l; (Exp-F = 10)

8.2 Exposure controls

For an approximate assay of ethanol in air, test tubes of the type of Drager tubes are suitable,
e.g. Compur (549 210 type 104 SA), Drager (81 01631 type Alcohol 25/a), Auer (5085-818 type Ethanol 100)
or passive samplers:
e.g. 3M Organic Vapour Monitor 3500B or the Drager Orsa5.

8.2.1 Appropriate engineering controls

Handle ethanol only with adequate ventilation, specially in closed rooms.
Take technical measures e.g. ventilation and local exhaust ventilation in order to avoid that a limit value is exceeded.
These measures, especially the exhaust ventilation near the ground, are also needed for avoiding the accumulation of explosive vapour-air mixtures.
Use only explosion proof ventilation equipment.

8.2.2 Individual protection measures, such as personal protective equipment

The personal protective equipment should be selected selectively for the work place, depending of the quantity and the concentration of the substances.
The compliance with the EN international standards EN 482 and EN 689 on personal protective equipment should be checked (according to directive (EU) 2016/425) .

Respiratory protection:

Respiratory protection is not necessary if the room has adequate ventilation / local exhaust ventilation.
In special situations (e.g. accidental release) use full face mask with filter of type A (brown) or ABEK (EN 14387) in addition to the technical measures, (e.g. explosion-proof mobile ventilation equipment).
Filters of type A1 are suitable up to 1000 ppm, filters of type A2 up to 5000 ppm and filters of type A3 up to 10000 ppm .
If needed as a result of the risk evaluation, use self-contained breathing apparatus with full face mask.

Hand protection:

Use chemical protection gloves of category III, according to standard EN 374 (with the "CE" mark).
The following glove materials are suitable for direct contact with ethanol:
Butyl rubber (0.5 mm, penetration time >8 h)
Fluorocarbon rubber (0.4 mm, penetration time >8 h)
Polychloroprene (Neoprene; 0.5 mm, penetration time ca. 2 h)
The following glove materials are not suitable for direct contact with the product:
Natural rubber/Latex (NR), nitrile rubber (NBR), PVC, (but nitrile rubber may be used for splash protection).

Eye / face protection

Use chemical safety goggles with side protection according to EN 166:2001.
If needed as a result of the risk evaluation, use face shield or a full face respiratory mask.
At the work place an emergency eye wash station must be available.

Body protection:

Use solvent resistant antistatic protective clothing of flame retardant fabric.
Use footwear with conductive sole (and keep the floor of exposed rooms conductive).

8.2.3 Environmental exposure controls

According to the Swiss ordinance on the protection of the air, ethanol is classified as an organic substance of class 3. This means that the emission concentration must not be higher than 150 mg/m3 if the mass flow is equal to or above 3.0 kg/h.

8.3 Exposure scenarios

For this product no exposure scenarios are available.
Exposure scenarios for non denatured ethanol are available on request.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

The values marked with (ethanol) below apply to undiluted, undenatured ethanol.

Appearance:	colourless, clear liquid
Odour:	odour of alcohol
Odour threshold	93 ppm (49 - 716 ppm) ; 178 mg/m3
pH of aqueous solutions (10 g/l):	ca. 7
Melting point/freezing point:	-114 °C
Initial boiling point and boiling range (at 1013 hPa):	78 °C (ethanol)
Flash point:	12 - 13 °C (ethanol) (closed crucible)
Evaporation rate (Ether = 1):	8 (ethanol)
Flammability (solid, gas):	highly flammable
Lower explosive limit:	3,1 Vol%, 59 g/m3 (ethanol)
Upper explosive limit:	27.7 Vol%, 532 g/m3 (ethanol)
Vapour pressure (at 20 °C / at 50 °C):	58 hPa (20 °C) / 293 hPa (50 °C) (ethanol)
Relative vapour density (air = 1):	1.6
Relative density (20 °C):	ca. 0.81 g/cm3
Solubility in water (20 °C):	completely miscible
Solubility in solvents (20 °C):	miscible with most organic solvents
Partition coefficient: n-octanol/water:	log Kow = -0.3 (ethanol)
Auto-ignition temperature:	425 °C (ethanol)
Decomposition temperature	not applicable (not self-reactive)
Dynamic viscosity (20 °C):	1.2 mPa s (ethanol)
Kinematic viscosity (20 °C):	1.52 mm2/s (ethanol)
Oxidising properties:	none
Explosive properties:	vapour-air mixtures are explosive

9.2 Other information

Percent content of water:	ca. 5.8 % m/m
Organic solvents / VOC content:	ca. 94 % m/m
Fat solubility:	well soluble
Gas group (explosion group)	IIB
Temperature class:	T2 (max. 300 °C)
Safe gap value:	0.89 mm

SECTION 10: Stability and reactivity

10.1 Reactivity

Ethanol reacts violently with strong oxidising agents, strong reducing agents, acids, acid anhydrides, alkali metals, peroxides, producing extreme heat.

10.2 Chemical stability

Under normal conditions (ambient temperature) ethanol is chemically stable.

10.3 Possibility of hazardous reactions

Explosion danger by contact with alkali metals, alkali oxides, calcium hypochlorite, acidic anhydride, sulphur fluoride, mercury nitrate, silver/nitric acid, silver nitrate, silver nitrate/ammonia, silver oxide/ammonia, nitrogen dioxide, hydrogen peroxide.
Ethanol may react dangerously with acetyl bromide, acetyl chloride, bromine trifluoride, chromium trioxide, chromyl chloride; ethylene oxide, fluorine, potassium-tert-butoxide, lithium hydride, phosphorous trioxide, platinum black, uranium hexafluoride, zirconium(IV)-chloride, zirconium(IV)-iodide.
Vapours form explosive mixture with air. Temperatures above 9° C favour the evaporation of ethanol which may form an explosive atmosphere with air.
Emptied, non cleaned containers may contain inflammable mixtures of vapours with air, presenting an explosion risk!

10.4 Conditions to avoid

Do not heat - no flames, no sparks or other sources of ignition or conditions favouring static discharge. No smoking.
Do not drill, cut, grind, solder, braze, and weld etc. in the Ex-zone (except with written permit to weld).
Prevent vapours from entering into drainage system, pits or cellars (danger of explosion).

10.5 Incompatible materials

See sections 10.1 and 10.3.

10.6 Hazardous decomposition products

Flammable gases (e.g. hydrogen) may form by contact with strong oxidation agents, acids or with alkali metals.

SECTION 11: Toxicological information

Abbreviations being used in this section:

LD50 = Lethal dose 50 %	DNEL = Derived no effect level
LC50 = Lethal concentration 50 %	NOAEL = No observed adverse effect level
CMR = Carcinogenicity, Mutagenicity, Reproductive toxicity	NOAEC = No observed adverse effect conc.
Exp-F = Extrapolation factor	ATE = Acute Toxicity Estimate
	SIEF = Substance Information Exchange Forum

11.1 Information on toxicological effects of ethanol

The information in this section is valid for normal non-denatured ethanol. Most of it is contained in the Chemical Safety Report or the REACH registration dossier of ethanol or found in the GESTIS database on hazardous substances.
Ethanol has no endocrine disrupting properties.
The hazard classes applicable to ethanol and the denaturants are indicated in section 3.2.

Acute toxicity

Relevant LD/LC50 values for the classification (= ATE according to the decision of the SIEF for the REACH registration of ethanol)

LD50, oral, rat, mouse	10470 mg/kg
LD50, dermal, rabbit	15800 mg/kg
LC50, inhalative, rat, mouse (exposure 4 h)	30000 mg/m3

Corrosion/irritation

Skin:	not irritant
Eyes:	irritant
Respiratory tract:	depends on the concentration
Corrosion:	Ethanol is not corrosive
Sensitization of the skin:	Ethanol is not sensitising
Sensitization of the respiratory tract:	Ethanol is not sensitising

[Toxicity effect Data for the work place

Local toxicity effects, acute, inhalative	no hazard identified
Local toxicity effects, acute, dermal	no hazard identified
Local toxicity effects, chronic, inhalative	no hazard identified
Local toxicity effects, chronic, dermal	no hazard identified
Systemic toxicity effects, acute, dermal	no hazard identified
Systemic toxicity effects, acute, inhalative	no hazard identified
Systemic toxicity effects, chronic, dermal	DNEL = 343 mg/kg per day (Exp-F = 24)
Systemic toxicity effects, chronic, dermal	NOAEL = 8232 mg/kg per day
Systemic toxicity effects, chronic, inhalative	DNEL = 950 mg/m3 (Exp-F = 1)

[Toxicity effect data for the general population

Local toxicity effects, acute, inhalative	DNEL = 950 mg/m3 (Exp-F = 1)
Local toxicity effects, acute, dermal	no hazard identified
Local toxicity effects, chronic, inhalative	no hazard identified
Local toxicity effects, chronic, dermal	no hazard identified
Systemic toxicity effects, acute, oral	no hazard identified
Systemic toxicity effects, acute, dermal	no hazard identified
Systemic toxicity effects, acute, inhalative	no hazard identified
Systemic toxicity effects, chronic, oral	DNEL = 87 mg/kg per day (Exp-F = 20)
Systemic toxicity effects, repeated dose, oral	NOAEL = 1730 mg/kg per day
Systemic toxicity effects, chronic, dermal	DNEL = 206 mg/kg per day (Exp-F = 40)
Systemic toxicity effects, chronic, dermal	NOAEL = 8238 mg/kg per day
Systemic toxicity effects, chronic, inhalative	DNEL = 114 mg/m3 (Carcinogenicity)

Carcinogenicity

Carcinogenicity (rat)	NOEL >3000 mg/kg
Carcinogenicity (mouse) female:	NOAEL > 44000 mg/kg
Carcinogenicity (mouse) male:	NOAEL > 4250 mg/kg

Mutagenicity

Mutagenicity (bacteria)	Tests negative

Reproductive toxicity

Effects on fertility (oral)	NOAEL = 13800 mg/kg per day
Effects on fertility (dermal)	no data available
Effects on fertility (inhalative)	NOAEC = 30400 mg/m3
Development toxicity(oral)	NOAEL = 5200 mg/kg per day
Development toxicity (dermal)	no data available

Development toxicity (inhalative)	NOAEC = 39 000 mg/m3

The German Forschungsgemeinschaft DFG classified the CMR properties of ethanol as follows:

Genotoxicity:	DFG group 2 of mutagenic substances
Carcinogenicity:	DFG category 5 of carcinogenic substances
Foetotoxicity:	DFG group C of foetotoxic substances

These classifications of the DFG are not legally enforceable.

Aspiration toxicity ethanol is not classified Asp. Tox. 1

Experience about the toxic effects on humans
Effects of acute exposure:
Effects on eyes/severe eye irritation: Pain/irritation, watering, redness.
Effects of inhalation: May cause respiratory irritation, drowsiness or dizziness/central nervous system depression.
Effects on the skin: No known significant acute effects or critical hazards.
Effects of ingestion: Irritating to mouth, throat and stomach, nauesa, possibly central nerve system depression.
Effects of subacute exposure:
The acute inhalative toxicity by inhalation to humans and animals is low.
Single exposures up to 5000 ml/m3 have no local or systemic effects on humans.
Only at much higher concentrations, effects on the central nervous system, e.g. narcotic effects, occur.
Effects of chronic exposure:
Repeated inhalative exposures at the occupational exposure limit results in blood ethanol concentrations far below the threshold values for effects on the central nervous system.
Long-term consumption of high alcohol quantities results in toxic effects in nearly all organ systems.

11.2 Toxicological properties of denaturants with concentration ≥0.5 %

Information source: Dossier of the REACH registration (from the ECHA website).

METHYL ETHYL KETONE (MEK), 2-BUTANONE	CAS No: 78-93-3
Concentration	2% m/m
Acute toxicity, oral	LD50 rat = 4.29 mL/ kg / 3450 mg/kg
Acute toxicity, dermal	LD50 (rabbit) >10 mL mg/kg / >8000 mg/kg
Acute toxicity inhalation	no data available
Repeated dose toxicity, oral	no data available
Repeated dose toxicity, dermal	no data available
Repeated dose toxicity inhalation	NOAEC, rat = 5041 ppm / 15.1 mg/L
Skin corrosion/irritation	no data available
Eye damage/irritation	rabbit: irritating (category 2)
Skin sensitization	guinea pig: not sensitising
Respiratory sensitization	no data available
Local effects, acute, inhalation, worker	no data available
Local effects, long term exposure, inhalation, worker	no data available
Systemic effects, long term exposure, inhalation, worker	DNEL = 600 mg/m3
Systemic effects, long term exposure, dermal, worker	DNEL = 1161 mg/kg /day
Carcinogenicity/mutagenicity/toxicity to reproduction	not classified

SECTION 12: Ecological information

The information in this section is valid for normal non-denatured ethanol. Most of it is contained in the Chemical Safety Report of the REACH registration dossier of ethanol or found in the GESTIS database on hazardous substances.

Abbreviations being used in this section:
LC50 = Lethal concentration 50 %
EC50 = Effect concentration 50 % (Effect: e.g. immobilization of invertebrates)
EC10 = Effect concentration 10 % (effect being observed on 10 % of the laboratory animals)
PNEC = Predicted no effect concentration (for environmental toxicity) Exp-F = Extrapolation factor
PBT = Persistent, bioaccumulative, toxic
vPvB = very persistent, very bioaccumulative

12.1 Environmental toxicity

LC50 acute, for freshwater fish	11200 mg/l
LC50 long-term, for freshwater fish	no data available
EC50/LC50 acute, for freshwater invertebrates	5012 mg/l
EC50/LC50 acute, for seawater invertebrates	857 mg/l
EC10/LC10 or NOEC long-term, for freshwater invertebrates	9.6 mg/l
EC10/LC10 or NOEC long-term, for seawater invertebrates	79 mg/l
EC50/LC50 acute, for freshwater algae	275 mg/l
EC50/LC50 acute, for seawater algae	1970 mg/l
EC10/LC10 or NOEC long-term, for freshwater algae	11.5 mg/l

EC10/LC10 or NOEC long-term, for seawater algae	1580 mg/l
LC50 for sediment organisms	8200 -10000 mg/l
EC50/LC50 for land plants	633 mg/kg soil
EC50/LC50 for water microorganisms	5800 mg/l

[PNEC-Values (Predicted No Effect Concentration)

Freshwater organisms, continuous liberation	
Seawater organisms, continuous liberation	PNEC = 0.79 mg/l (Exp-F = 100)
Freshwater sediment microorganisms	PNEC = 3.6 mg/kg sediment (distrib.-coeff.)
Seawater sediment microorganisms	PNEC = 2.9 mg/kg sediment (no F-indication)
Soil microorganisms	PNEC = 0.63 mg/kg soil (Exp-F = 1000)
Freshwater organisms, intermittent release	PNEC = 2.75 mg/l (Exp-F = 100)
Sewage microorganisms	PNEC = 580 mg/l (Exp-F = 10)
Predators oral (secondary poisoning)	PNEC = 0.38 g/kg food

12.2 Persistence and degradability

Biological degradability in the modified OECD Screening Test	0.94
Biological oxygen demand BOB5	0.93 - 1.67 g/g

12.3 Bioaccumulative potential

Bioconcentration factor (BCF):	0.66
Distribution coefficient octanol/water	log Kow = -0.3

12.4 Mobility in soil
Ethanol is very volatile and evaporates easily from the soil surface.

12.5 Results of PBT and vPvB assessment

PBT	not applicable
vPvB	not applicable

Because of the low distribution coefficient and the good biodegradability, bioaccumulation in organisms is not expected.

12.6 Other adverse effects no data available

SECTION 13: Disposal considerations

Do not dispose of ethanol waste through the drains.

13.1 Waste treatment methods
Recycling by distillation. If recovery is not feasible, wastes have to be eliminated in accordance with local requirements, i.e. by an approved waste disposal company.

Swiss VeVA waste code:	S 20 01 13 Solvents
European waste code:	20 01 13* Solvents
For mixtures containing ethanol, other waste codes may be applicable.	
Waste code for contaminated adsorbents, wiping cloths, protective clothing:	S 15 02 02 (CH), resp. 15 02 02* (EU)

Non cleaned receptacles
Vapours in emptied but not dried receptacles present an extreme danger of explosion. These receptacles should be cleaned.
Never give away "empty" drums for solvents to a private person. Never drill, cut, grind, sold, braze or weld on such a drum.
The waste code for "Packaging materials containing residues of hazardous residues or contaminated by hazardous substances" is: S 15 01 10, (CH), resp. 15 01 10* (EU)

Cleaned receptacles
Cleaned receptacles may be reused.
Recommended cleaning agent: water.

SECTION 14: Transport information

14.1 UN number 1170

14.2 UN proper shipping name

ADR/RID (normal qualities up to 96 %):	1170 ETHANOL,SOLUTION (ETHYL ALCOHOL,SOLUTION)
ADR/RID (anhydrous qualities >96 %):	1170 ETHANOL (ETHYL ALCOHOL)
IMDG-Code (normal qualities up to 96 %):	ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)
IMDG-Code (anhydrous qualities >96 %):	ETHANOL (ETHYL ALCOHOL)
ICAO-TI / IATA-DGR:	ETHANOL or ETHANOL SOLUTION

14.3 Transport hazard class

For all routes of transportation:	Class 3 (Flammable liquid)
Hazard label:	3

14.4 **Packing group**

For all routes of transportation:	II

14.5 Environmental hazards

Pictogram "environmental hazard" (all routes of transportation):	No / (ADN/(ADNR: Yes)
Marine Pollutant:	No

14.6 Special precautions for user Warning: Flammable liquid

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
The product is exclusively transported in appropriate, approved receptacles.

14.8 Other information

Number of danger (ADR/RID):	33
Tunnel restriction code (ADR	D/E
EMS number (IMDG):	F-E,S-D
UN "Model regulation ":	UN 1993, FLAMMABLE LIQUID, 3, II
Limited quantity (ADR/RID):	LQ4

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for this product
Specific EU legislation

Regulation (EC) No 2037/2000 (substances that deplete the ozone layer):	Not applicable
Regulation (EC) No 850/2004 (persistent organic pollutants):	Not applicable
Regulation (EC) No 689/2008 (exportation and importation of dangerous chemicals):	Not applicable
Directive 2002/95/EC (RoHS directive, substances in the RoHS list)	Not applicable
Regulation (EU) 528/2012 (on biocidal products).	Status of ethanol as active substance is "in discussion"
Authorisation according to title VII of the REACH regulation (EC) No 1907/2006:	Not concerned
Restrictions according to title VIII of the REACH regulation (EC) No 1907/2006:	None

National legislation of Germany:

Class according to AwSV Annex 1 of endangering the aquatic environment:	WGK = 1 (slightly hazardous)
VOC percent content according to the solvent regulation (31. BImSchV):	ca. 94 % m/m

National legislation of Switzerland:

Ordinance on biocide products, SR 813.12	Status of ethanol as active substance is "in discussion"
Ordinance on risk reduction, SR 814.81	No restriction
PIC Ordinance, 814.82	No restriction
Major accidents ordinance, SR 814.012	Refer to section 7.2
Ordinance on the protection of the air, 814.318.142.1	Refer to section 8.2.3
Technical ordinance on wastes, SR 814.600	General provisions about wastes
Ordinance on the transportation of wastes, SR 814.610	Refer to section 13.1
Ordinance on the incentive tax on VOC, SR 814.018; VOC content:	ca. 94 % m/m
Mutterschutzverordnung, SR 822.111.52	No employment restrictions due to ethanol
Jugendarbeitsschutzverordnungen , SR 822.115 und SR 822.115.2	No employment restrictions due to ethanol
Swiss water pollutant class	B (is only of relevance for large quantities)

15.2 Chemical safety assessment
A chemical safety assessment hasn't been carried out for denatured ethanol. However there is a chemical safety report on non-denatured ethanol. The data contained in it have been taken into account in this safety data sheet. As the concentration of the denaturing agents is rather low, most results of the chemicals safety report are also valid for this denatured quality.

SECTION 16: Other information

This information in this data sheet is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.
This product is for professional use only.

16.1 Hazard identification statements used in sections 2 an 3

Eye Irrit. 2 = Serious eye damage/eye irritation, category 2
Flam. Liq. 2 = Flammable liquid, category 2
STOT SE 3 = Specific target organ toxicity, category 3

Hazard statements

H225 = Highly flammable liquid and vapour.
H319 = Causes serious eye irritation.
H336 = May cause drowsiness or dizziness.

Pictograms

GHS01 = Exploding bomb
GHS02 = Flame
GHS03 = Flame over circle
GHS04 = Gas cylinder
GHS05 = Corrosion
GHS06 = Skull and crossbones
GHS07 = Exclamation mark
GHS08 = Health hazard
GHS09 = Environment

16.2 All precautionary statements of ethanol (according to the chemical safety report):

Remark: The labels should not contain more than 6 P statements.
The use of P-phrases 102 and 501 is mandatory for the labelling of products for the general public.
P102 = Keep out of reach of children
P210 = Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233 = Keep container tightly closed.
P240 = Ground/bond container and receiving equipment.
P241 = Use explosion-proof electrical/ventilating/lighting/equipment.
P242 = Use only non-sparking tools.
P243 = Take Precautionary measures against static discharge.
P264 = Wash hands thoroughly after handling.
P280 = Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353 = IF ON SKIN (or hair): Remove/Take of immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 = IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 = If eye irritation persists: Get medical advice/attention.
P370+P378 = In case of fire: Use extinguishing media specified in section 5.1 for extinction.
P403+P235 = Store in a well-ventilated place. Keep cool.
P501 = Dispose of contents/container in accordance with local/regional/national/international regulations.

16.3 Other abbreviations and acronyms

ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road
AwSV = Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (Germany; for WGK)
BImSchV = Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (Germany)
CAS = Chemical Abstracts Service
DIN = German national standard
EC = Effective concentration (e.g. EC50 for the acute toxicity to Daphnia: 50 % of the Daphnia get immobilised)
EC = European community
EMS = Emergency procedures for ships carrying dangerous goods (IMDG)
EN = European standard
GHS = Globally Harmonised System
IATA = International Air Transport Association
IATA-DGR = International Air Transport Association-Dangerous Goods Regulations
IBC-Code = International Code for construction and equipment of ships carrying dangerous chemicals in bulk
ICAO-TI = International Standards Organization
IMDG-Code = International Maritime Code for Dangerous Goods
ISO = Standard of the International Standards Organization
IUCLID = International Uniform Chemical Information Database
LC50 = Lethal concentration, 50 %
LD50 = Lethal dose, 50%
Log Kow = Distribution coefficient between octanol and water
MARPOL = Maritime Pollution Convention = International Convention for the Prevention of Pollution from Ships
OECD = Organisation for Economic Cooperation and Development
PBT = Persistent, bioaccumulative and toxic
RID = Regulations concerning the International Carriage of Dangerous Goods by Rail
TRGS = Technical regulation for hazardous substances (Germany)
UN = United Nations

VOC = Volatile Organic Compounds (USA, EU, CH)
VOCV = Swiss ordinance on the Incentive Tax on Volatile Organic Compounds, SR 814.018
vPvB = very persistent and very bioaccumulative
WGK = Wassergefährdungsklasse (Water hazard class, Germany)

16.4 **Miscellaneous**

Important information sources used
The Chemical safety report of the REACH registration dossier of ethanol, containing the exposure scenarios.
The GESTIS database on hazardous substances, the relevant regulations and the safety data sheets of the ingredients.
The the REACH registration dossiers of the denaturants (on the website of ECHA).

Advice on appropriate training for workers
The workers handling hazardous substances and products (use, storage, cleaning of containers, etc.) must be correspondingly instructed when starting occupation and at regular intervals. The instructions have to include all necessary information and practical training on protective measures regarding safety, health protection, first-aid measures and environmental considerations.
Without adequate instruction no risk bearing activities should be permitted.

Method of classification used
The classification the procedure was used, given in the regulation (EC) No 1272/2008 for the classification of mixtures based on its ingredients if data are available for all ingredients.

Note on the format of the concentration information
The concentration data in the form of "ca... "%" indicate that only the exact values
of the product specifications are binding.