

**Safety data sheet**  
according to 1907/2006/EC, Article 31

Printing date 12.02.2019

Version number 23

Revision: 12.02.2019

**SECTION 1: Identification of the substance/mixture and of the company/undertaking**

- **1.1 Product identifier**
- **Molecular formula:** C<sub>2</sub>H<sub>6</sub>O
- **Structure formula:** C H<sub>3</sub> - C H<sub>2</sub> - O H
- **Trade name:** Ethyl alcohol
- **MSDS number:** CH0044
- **CAS Number:**  
64-17-5
- **EC number:**  
200-578-6
- **Index number:**  
603-002-00-5
- **Registration number** 01-2119457610-43
- **1.2 Relevant identified uses of the substance or mixture and uses advised against**  
Only for the use of professionals users  
No further relevant information available.
- **Life cycle stages**  
IS Use at industrial Sites  
M Manufacture  
F Formulation or re-packing
- **Sector of Use**  
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)  
SU9 Manufacture of fine chemicals  
SU24 Scientific research and development
- **Product category**  
PC9a Coatings and paints, thinners, paint removers  
PC20 Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents  
PC21 Laboratory chemicals  
PC29 Pharmaceuticals  
PC40 Extraction agents
- **Process category**  
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.  
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions  
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition  
PROC4 Chemical production where opportunity for exposure arises  
PROC5 Mixing or blending in batch processes  
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities  
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities  
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)  
PROC10 Roller application or brushing  
PROC11 Non industrial spraying  
PROC14 Tableting, compression, extrusion, pelletisation, granulation  
PROC15 Use as laboratory reagent
- **Environmental release category**  
ERC1 Manufacture of the substance  
ERC2 Formulation into mixture  
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)  
ERC6a Use of intermediate  
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
- **Application of the substance / the mixture** Chemicals products for laboratory

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· **1.3 Details of the supplier of the safety data sheet**

· **Manufacturer/Supplier:**

CARLO ERBA REAGENTS

Chaussée du Vexin

Parc d'Affaires des Portes - BP616

27106 VAL DE REUIL Cedex

Téléphone: +33 (0)2 32 09 20 00

Télécopie: +33 (0)2 32 09 20 20

· **Further information obtainable from:**

Q.A / Normative

email: MSDS\_CER-SDS@cer.dgroup.it

· **1.4 Emergency telephone number:**

France (ORFILA 24h/24) - Tel : +33 (0)1 45 42 59 59

Ireland - Tel : 00 353 1 8092568 - 00 353 1 8379964 (24h/24)

EU Tel : 112

**SECTION 2: Hazards identification**

· **2.1 Classification of the substance or mixture**

· **Classification according to Regulation (EC) No 1272/2008**



GHS02 flame

Flam. Liq. 2 H225 Highly flammable liquid and vapour.



GHS07

Eye Irrit. 2 H319 Causes serious eye irritation.

· **2.2 Label elements**

· **Labelling according to Regulation (EC) No 1272/2008**

The substance is classified and labelled according to the CLP regulation.

· **Hazard pictograms**



GHS02



GHS07

· **Signal word Danger**

· **Hazard statements**

H225 Highly flammable liquid and vapour.

H319 Causes serious eye irritation.

· **Precautionary statements**

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P241 Use explosion-proof [electrical/ventilating/lighting] equipment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or 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.

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- P337+P313 *If eye irritation persists: Get medical advice/attention.*
- **2.3 Other hazards -**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

### SECTION 3: Composition/information on ingredients

- **3.1 Chemical characterisation: Substances**
- **CAS No. Description**  
64-17-5 Ethyl alcohol
- **Identification number(s)**
- **EC number:** 200-578-6
- **Index number:** 603-002-00-5

### SECTION 4: First aid measures

- **4.1 Description of first aid measures**
- **General information:** Involve doctor immediately.
- **After inhalation:**  
*Supply fresh air; consult a doctor in case of complaints.*  
*Move the person into fresh air and immediately consult a doctor*  
*Supply fresh air. If required, provide artificial respiration. Consult doctor.*
- **After skin contact:** *If skin irritation continues, consult a doctor.*
- **After eye contact:** *Rinse opened eye for several minutes under running water. Then consult a doctor.*
- **After swallowing:**  
*Do not induce vomiting; call for medical help immediately.*  
*Call for a doctor immediately.*
- **4.2 Most important symptoms and effects, both acute and delayed** *No further relevant information available.*
- **Information for doctor:** *Show the doctor this Material Safety Data Sheet.*
- **4.3 Indication of any immediate medical attention and special treatment needed**  
*No further relevant information available.*

### SECTION 5: Firefighting measures

- **General Information:**  
*As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.*
- **5.1 Extinguishing media**
- **Suitable extinguishing agents:** *CO<sub>2</sub> or alcohol resistant foam.*
- **For safety reasons unsuitable extinguishing agents:** *Water with full jet.*
- **5.2 Special hazards arising from the substance or mixture** *Carbon monoxide and carbon dioxide*
- **5.3 Advice for firefighters**
- **Protective equipment:** *Do not inhale gases in case of fire or combustion.*
- **Additional information** *Keep receptacles cool with water spray.*

### SECTION 6: Accidental release measures

- **General Information:** *Use proper personal protective equipment as indicated in Section 8.*

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- **6.1 Personal precautions, protective equipment and emergency procedures**  
 Keep away any ignition source.  
 Wear protective equipment. Keep unprotected persons away.  
 Ensure adequate ventilation
- **6.2 Environmental precautions:**  
 Inform respective authorities in case of seepage into water course or sewage system.  
 Dilute with plenty of water after collecting the liquid.  
 Prevent seepage into sewage system, workpits and cellars.
- **6.3 Methods and material for containment and cleaning up:**  
 Collect the liquid with vacuum in a suitable container and absorb the remainder with a porous material (diatomite, acid binders, universal binders, etc).  
 Ensure adequate ventilation.
- **6.4 Reference to other sections**  
 See Section 7 for information on safe handling.  
 See Section 8 for information on personal protection equipment.  
 See Section 13 for disposal information.

### SECTION 7: Handling and storage

- **7.1 Precautions for safe handling**  
 Store in cool, dry place in tightly closed receptacles.  
 Only handle and refill product in closed systems or under local exhaust.  
 Pneumatic conveyance only with nitrogen or other inert gases.
- **Information about fire - and explosion protection:**



Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**  
 Store in a cool location.  
 Use only receptacles specifically permitted for this substance/product.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Store in cool, dry conditions in well sealed receptacles.
- **7.3 Specific end use(s)** No further relevant information available.

### SECTION 8: Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **8.1 Control parameters**

 · **Ingredients with limit values that require monitoring at the workplace:**
**CAS: 64-17-5 Ethyl alcohol**
**WEL** Long-term value: 1920 mg/m<sup>3</sup>, 1000 ppm

 · **DNELs**

Dermal	DNEL (workers-systemic chronic effects)	343 mg/kg
Inhalative	DNEL (workers-local effects Acute)	19 mg/m <sup>3</sup>
	DNEL (workers-systemic chronic effects)	950 mg/m <sup>3</sup>

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· **PNECs**

PNEC (Fresh water)	0.96 mg/l
PNEC (Freshwater sediment)	3.6 mg/kg
PNEC (Marine water)	0.79 mg/l
PNEC (Seawater sediment)	2.9 mg/l
PNEC (STP)	580 mg/l
PNEC (Soil)	0.63 mg/kg

· **Additional information:** The lists valid during the making were used as basis.

· **8.2 Exposure controls**

· **Personal protective equipment:**

· **General protective and hygienic measures:**

The usual precautionary measures are to be adhered to when handling chemicals.

Keep away from foodstuffs, beverages and feed.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes.

· **Respiratory protection:**

Use suitable respiratory protective device only when aerosol or mist is formed.

Filter AX

Filter P2

The selected respiratory protection must comply with standard EN 136/140/143/145/149.

· **Protection of hands:**

The selected protective gloves have to satisfy the specifications of REGULATION (EU) 2016/425 and the standard EN 374 derived from it.

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

Rubber gloves

Avoid direct contact with the chemical/ the product/ the preparation by organisational measures.

· **Material of gloves**

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **For the permanent contact gloves made of the following materials are suitable:**

The penetration time has to be at least 480 minutes

Butyl rubber, BR

Recommended thickness of the material:  $\geq 0.5$  mm

Nitrile rubber, NBR

Recommended thickness of the material:  $\geq 0.4$  mm

· **Eye protection:**



Tightly sealed goggles

· **Body protection:** Protective work clothing

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- **Limitation and supervision of exposure into the environment**  
In case of unintended release of the product: See section 6 of the Safety Data Sheet.
- **Risk management measures** Keep good industrial hygiene.

### SECTION 9: Physical and chemical properties

#### · 9.1 Information on basic physical and chemical properties

· <b>Molecular weight</b>	46 g
· <b>Appearance:</b>	
· <b>Form:</b>	Fluid
· <b>Colour:</b>	Colourless
· <b>Odour:</b>	Alcohol-like
· <b>Odour threshold:</b>	Not determined.
· <b>Important information on protection of health and environment, and on safety.</b>	MIE (TRGS-727) 0.28 mJ
· <b>pH-value:</b>	7
· <b>Change in condition</b>	
· <b>Melting point/freezing point:</b>	-114.5 °C
· <b>Initial boiling point and boiling range:</b>	78 °C
· <b>Flash point:</b>	13 °C
· <b>Flammability (solid, gas):</b>	Not applicable.
· <b>Ignition temperature:</b>	425 °C
· <b>Decomposition temperature:</b>	Not determined.
· <b>Auto-ignition temperature:</b>	Not determined.
· <b>Explosive properties:</b>	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.
· <b>Explosion limits:</b>	
· <b>Lower:</b>	3.5 Vol %
· <b>Upper:</b>	27.7 Vol %
· <b>Vapour pressure at 20 °C:</b>	59 hPa
· <b>Vapour pressure (2) at 50 °C:</b>	280 hPa
· <b>Density at 20 °C:</b>	0.79 g/cm <sup>3</sup>
· <b>Relative density</b>	Not determined.
· <b>Vapour density</b>	Not determined.
· <b>Evaporation rate</b>	Not determined.
· <b>Solubility in / Miscibility with water:</b>	Fully miscible.
· <b>organic solvents:</b>	Miscible with many organic solvents.
· <b>Partition coefficient: n-octanol/water:</b>	-0.30016
· <b>Viscosity:</b>	
· <b>Dynamic at 20 °C:</b>	1.2 mPas
· <b>Kinematic:</b>	Not determined.
· <b>9.2 Other information</b>	No further relevant information available.

### SECTION 10: Stability and reactivity

- **10.1 Reactivity** See 10.3
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:**  
Keadaan yang Perlu Dielakkan: Haba, api dan percikan api.

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- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials:** No further relevant information available.
- **10.6 Hazardous decomposition products:** Carbon monoxide, Carbon dioxide.

### SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity** Based on available data, the classification criteria are not met.

#### · LD/LC50 values relevant for classification:

Oral	LD50	6,200-15,000 mg/kg (rat)
Dermal	LD50	17,100 mg/kg (rabbit)
Inhalative	LC50/4 h	117 mg/L (rat)
	LC50	>50 mg/m <sup>3</sup> (rat)

- **Primary irritant effect:**
- **Skin corrosion/irritation** Based on available data, the classification criteria are not met.
- **Serious eye damage/irritation**  
Causes serious eye irritation.
- **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
- **Other information (about experimental toxicology):** No further relevant information available.
- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**
- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity** Based on available data, the classification criteria are not met.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.

### SECTION 12: Ecological information

#### · 12.1 Toxicity

##### · Aquatic toxicity:

EC50/48h	5,012 mg/l (Daphnia) (freshwater)
EC50	72 mg/L (algae)
LC50/96h	11,200 mg/l (fishes) (freshwater)

- **12.2 Persistence and degradability** No further relevant information available.
- **Method**
- **Ecological information** Not available
- **Other information:** The product is easily biodegradable.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**  
Water hazard class 1 (German Regulation) (Assessment by list): slightly hazardous for water  
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- **12.5 Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

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 · **12.6 Other adverse effects** No further relevant information available.

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### SECTION 13: Disposal considerations

**13.1 Waste treatment methods**
**Recommendation**

Must not be disposed together with household garbage. Do not allow product to reach sewage system. Reutilise if possible or contact a waste processors for recycling or safe disposal.

**Waste disposal key:**

The European Union does not establish uniform rules for the disposal of chemical waste, which are special waste. Their treatment and elimination of the domestic legislation of each country. So, in each case, you should contact the relevant authorities, or those companies legally authorized for elimination of waste. 2014/955/UE: Council Decision of 18 December 2014 amending the list of wastes contained in Decision 2000/532/EC.

Council Directive 91/156/EEC of 18 March 1991 amending Directive 75/442/EEC on waste.

**Uncleaned packaging:**

The containers and packaging materials contaminated with dangerous substances or preparations, have the same treatment of products.

Directive 94/62/EC of the European Parliament and the Council of 20 December 1994 on packaging and packaging waste.

**Recommendation:**

Disposal must be made according to official regulations.

Packagings that may not be cleansed are to be disposed of in the same manner as the product.

· **Recommended cleansing agents:** Water, if necessary together with cleansing agents.

### SECTION 14: Transport information

**14.1 UN-Number**

 · **ADR, IMDG, IATA**

UN1170

**14.2 UN proper shipping name**

 · **ADR**

1170 ETHANOL (ETHYL ALCOHOL)

 · **IMDG**

ETHANOL (ETHYL ALCOHOL)

 · **IATA**

Ethanol

**14.3 Transport hazard class(es)**

 · **ADR**

 · **Class**

3 (F1) Flammable liquids.

 · **Label**

3

 · **IMDG, IATA**

 · **Class**

3 Flammable liquids.

 · **Label**

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· 14.4 Packing group · ADR, IMDG, IATA	II
· 14.5 Environmental hazards: · Marine pollutant:	No
· 14.6 Special precautions for user · Danger code (Kemler): · EMS Number: · Stowage Category	Warning: Flammable liquids. 33 F-E,S-D A
· 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code	Not applicable.
· Transport/Additional information:	
· ADR · Excepted quantities (EQ): · Limited quantities (LQ) · Excepted quantities (EQ)	E2 1L Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· Transport category · Tunnel restriction code	2 D/E
· IMDG · Limited quantities (LQ) · Excepted quantities (EQ)	1L Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· UN "Model Regulation":	UN 1170 ETHANOL (ETHYL ALCOHOL), 3, II

**SECTION 15: Regulatory information**

- 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
  - Directive 2012/18/EU
  - Named dangerous substances - ANNEX I Substance is not listed.
  - Seveso category P5c FLAMMABLE LIQUIDS
  - Qualifying quantity (tonnes) for the application of lower-tier requirements 5,000 t
  - Qualifying quantity (tonnes) for the application of upper-tier requirements 50,000 t
  - REGULATION (EC) No 1907/2006 ANNEX XVII Conditions of restriction: 3, 40
  - National regulations:
  - Information about limitation of use: -
  - Technical instructions (air):
- | Class | Share in % |
|-------|------------|
| NK    | 50-100     |
- Waterhazard class: Water hazard class 1 (Assessment by list): slightly hazardous for water.
  - 15.2 Chemical safety assessment: A Chemical Safety Assessment has been carried out.

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**SECTION 16: Other information**

This information 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.

• **Department issuing SDS:** Q.A./Normative

• **References**

ECDIN (Environmental Chem. Data and Information Network)

IUCLID (International Uniform Chemical Information Database)

NIOSH - Registry of Toxic Effects of Chemical Substances

Roth - Wassergefährdende Stoffe

Verschueren - Handbook of Environmental Data on Organic Chemicals

ChemDAT - Safety Data Sheets from E.Merck on CD-ROM

Merian - Metals and their compounds in the environment

• **Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

RCR : Risk Characterisation Ratio

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Flam. Liq. 2: Flammable liquids – Category 2

Eye Irrit. 2: Serious eye damage/eye irritation – Category 2

• **Sources**

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006, REACH, in latest valid version.

Regulation (EC) N° 1272/2008 of the European Parliament and of the Council of 16 December 2008, CLP, in the latest valid version.

Globally Harmonized System, GHS

ADR2019

• **\* Data compared to the previous version altered.**

The sections where alterations took place are marked with an asterisk in the left border.

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**Annex: Exposure scenario 1**

- **Short title of the exposure scenario** Substance manufacturing
- **Sector of Use**  
Industrial use.  
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)  
SU9 Manufacture of fine chemicals
- **Process category**  
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.  
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions  
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition  
PROC4 Chemical production where opportunity for exposure arises  
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities  
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
- **Environmental release category**  
ERC1 Manufacture of the substance  
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
- **Description of the activities / processes covered in the Exposure Scenario**  
See section 1 of the annex to the Safety Data Sheet.
- **Conditions of use** Customary application according to section 1.
- **Duration and frequency** 5 workdays/week.
- **Worker**  
5 workdays/week.  
8hrs (full working shift).
- **Physical parameters**  
The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.
- **Physical state** Fluid
- **Concentration of the substance in the mixture** Raw material.
- **Used amount per time or activity** 200000 tons per year
- **Other operational conditions**
- **Other operational conditions affecting environmental exposure**  
Observe section 6 of the Safety Data Sheet (Accidental release measures).
- **Other operational conditions affecting worker exposure**  
Take precautionary measures against static discharge.  
Keep away from sources of ignition - No smoking.  
Keep container tightly closed.  
Indoor application.
- **Other operational conditions affecting consumer exposure during the use of the product** Not applicable.
- **Risk management measures**
- **Worker protection**
- **Organisational protective measures**  
Keep good industrial hygiene.  
Ensure good ventilation. This can be achieved by using a local exhaustion or general exhaust system. If these measures are insufficient to keep the solvent vapour concentration below the workplace limit, wear an adequate respiratory protective device.  
For special applications, it is recommended to verify the chemical resistance of the above stated protective gloves with the manufacturer.  
Work clothes must not consist of textiles that exhibit dangerous melting behaviour in case of fire.
- **Technical protective measures**  
The work process has to be performed under closed conditions.

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Provide explosion-proof electrical equipment.

**Personal protective measures**

The selected protective gloves have to satisfy the specifications of REGULATION (EU) 2016/425 and the standard EN 374 derived from it.

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

Rubber gloves

Avoid direct contact with the chemical/ the product/ the preparation by organisational measures.

Protective work clothing

Tightly sealed goggles

**Environmental protection measures**

• **Water** Do not allow to reach sewage system.

• **Soil** Prevent contamination of soil.

• **Notes** In case of unintended release of the product: See section 6 of the Safety Data Sheet.

**Disposal measures**

Disposal must be made according to official regulations.

Ensure that waste is collected and contained.

**Disposal procedures**

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

• **Waste type** Partially emptied and uncleaned packaging

**Exposure estimation****Worker (dermal)**

The highest dermal exposure to be expected is 13.71 mg / kg / day.

The exposure estimation was carried out in accordance with ECETOC TRA.

**Worker (inhalation)**

The highest inhalative exposure to be expected is 50 ppm.

The exposure estimation was carried out in accordance with ECETOC TRA.

**Environment**

The highest environmental exposure to be expected in purification plants is 5.65 mg / L.

The highest environmental exposure to be expected for surface waters is 0.0742 mg / L.

The highest environmental exposure to be expected for soil is 0.00736 mg / kg wet weight.

• **Consumer** Not relevant for this Exposure Scenario.

**Guidance for downstream users**

For the risk assessment, the tools recommended by ECHA can be used.

Whether the downstream user acts within the scope of the Exposure Scenario can be verified based on the information in sections 1 to 8.

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**Annex: Exposure scenario 2**

- **Short title of the exposure scenario** Formulation or re-packing
- **Sector of Use**  
Industrial use.  
Substance for the industrial manufacture of preparations/mixtures.
- **Process category**  
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition  
PROC5 Mixing or blending in batch processes  
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities  
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities  
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)  
PROC14 Tableting, compression, extrusion, pelletisation, granulation
- **Environmental release category** ERC2 Formulation into mixture
- **Description of the activities / processes covered in the Exposure Scenario**  
See section 1 of the annex to the Safety Data Sheet.
- **Conditions of use**  
According to directions for use.  
Customary application according to section 1.
- **Duration and frequency** 5 workdays/week.
- **Worker** Long-term.
- **Environment** The product must not be released into the environment.
- **Physical parameters**  
The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.
- **Physical state** Fluid
- **Concentration of the substance in the mixture** Raw material.
- **Used amount per time or activity**  
30000 tons per year  
100000 kg per day
- **Other operational conditions** Observe the general safety regulations when handling chemicals.
- **Other operational conditions affecting environmental exposure** No special measures required.
- **Other operational conditions affecting worker exposure**  
Observe section 6 of the Safety Data Sheet (Accidental release measures).  
Take precautionary measures against static discharge.  
Keep away from sources of ignition - No smoking.
- **Other operational conditions affecting consumer exposure during the use of the product** Not applicable.
- **Risk management measures**
- **Worker protection**
- **Organisational protective measures**  
Keep good industrial hygiene.  
Ensure good ventilation. This can be achieved by using a local exhaustion or general exhaust system. If these measures are insufficient to keep the solvent vapour concentration below the workplace limit, wear an adequate respiratory protective device.
- **Technical protective measures**  
Carry out filling operations only at sites with extractors available.  
Provide explosion-proof electrical equipment.
- **Personal protective measures**  
Protective work clothing  
The selected protective gloves have to satisfy the specifications of REGULATION (EU) 2016/425 and the standard EN 374 derived from it.  
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation  
Protective gloves

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Rubber gloves

Safety glasses

• **Environmental protection measures**

• **Water** Do not allow to reach sewage system.

• **Soil** Prevent contamination of soil.

• **Notes** In case of unintended release of the product: See section 6 of the Safety Data Sheet.

• **Disposal measures** Ensure that waste is collected and contained.

• **Disposal procedures**

Must not be disposed together with household garbage. Do not allow product to reach sewage system.

• **Waste type** Partially emptied and uncleaned packaging

• **Exposure estimation**

• **Worker (dermal)**

The highest dermal exposure to be expected is 13.71 mg / kg / day.

The exposure estimation was carried out in accordance with ECETOC TRA.

• **Worker (inhalation)**

The highest inhalative exposure to be expected is 50 ppm.

The exposure estimation was carried out in accordance with ECETOC TRA.

• **Environment**

The highest environmental exposure to be expected in purification plants is 0.00533 mg / L.

The highest environmental exposure to be expected for surface waters is 0.00291 mg / L.

The highest environmental exposure to be expected for soil is 0.00162 mg / kg wet weight.

• **Consumer** Not relevant for this Exposure Scenario.

• **Guidance for downstream users**

For the risk assessment, the tools recommended by ECHA can be used.

Whether the downstream user acts within the scope of the Exposure Scenario can be verified based on the information in sections 1 to 8.

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**Annex: Exposure scenario 3**

- **Short title of the exposure scenario** Chemicals products for laboratory
- **Sector of Use** Industrial use.
- **Process category** PROC15 Use as laboratory reagent
- **Environmental release category**  
ERC2 Formulation into mixture  
ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)  
ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
- **Description of the activities / processes covered in the Exposure Scenario**  
See section 1 of the annex to the Safety Data Sheet.
- **Conditions of use**  
Customary application according to section 1.  
According to directions for use.
- **Duration and frequency** 5 workdays/week.
- **Worker 8hrs** (full working shift).
- **Physical parameters**  
The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.
- **Physical state** Fluid
- **Concentration of the substance in the mixture** Raw material.
- **Used amount per time or activity**  
20 tons per year  
1000 kg per day
- **Other operational conditions** Observe the general safety regulations when handling chemicals.
- **Other operational conditions affecting environmental exposure** No special measures required.
- **Other operational conditions affecting worker exposure**  
Take precautionary measures against static discharge.  
Keep away from sources of ignition - No smoking.
- **Other operational conditions affecting consumer exposure during the use of the product** Not applicable.
- **Risk management measures**
- **Worker protection**
- **Organisational protective measures** Keep good industrial hygiene.
- **Technical protective measures** Provide explosion-proof electrical equipment.
- **Personal protective measures**  
Do not inhale gases / fumes / aerosols.  
Safety glasses
- **Environmental protection measures**
- **Notes** In case of unintended release of the product: See section 6 of the Safety Data Sheet.
- **Disposal measures** Ensure that waste is collected and contained.
- **Disposal procedures**  
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Waste type** Partially emptied and uncleaned packaging
- **Exposure estimation**
- **Worker (dermal)**  
The highest dermal exposure to be expected is 0.34 mg / kg / day.  
The exposure estimation was carried out in accordance with ECETOC TRA.
- **Worker (inhalation)**  
The highest inhalative exposure to be expected is 10 ppm.  
The exposure estimation was carried out in accordance with ECETOC TRA.
- **Environment**  
The highest environmental exposure to be expected in purification plants is 1 mg / L.  
The highest environmental exposure to be expected for surface waters is 0.0155 mg / L.  
The highest environmental exposure to be expected for soil is 0.00215 mg / kg wet weight.

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· **Consumer** Not relevant for this Exposure Scenario.

· **Guidance for downstream users**

For the risk assessment, the tools recommended by ECHA can be used.

Whether the downstream user acts within the scope of the Exposure Scenario can be verified based on the information in sections 1 to 8.

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