

SAFETY DATA SHEET

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier:

Ethyl chloroformate

CAS number: 541-41-3

EC number: 208-778-5

Index number: 607-020-00-4

Registration number: 01-2119463324-42-0002; Transported isolated intermediate.

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

Organic synthesis intermediate for industrial use.

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

Framochem French-Hungarian Fine Chemicals Ltd.

3700 Kazincbarcika, Szerviz út 5, Pf. 504

Tel: (48) 311-991

Fax: (48) 512-162

1.3.1. Responsible person:

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E-mail:

info@framochem.hu

1.4. Emergency telephone number:

Public Toxicological Health Service (ETTSZ)

1097 Budapest, Albert Flórián út 2-6.

Tel.: +36 80 201 199 (0-24, free of charge – only from Hungary)

Tel.: +36 1 476 6464 (0-24, normal charge – also from foreign countries)

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture:

Classification according to Regulation (EC) No 1272/2008 (CLP):

Flammable liquids, Hazard Category 2 – H225

Acute toxicity (oral), Hazard Category 3 – H301

Skin corrosion/irritation, Hazard Category 1B – H314

Acute toxicity (inhalation), Hazard Category 1 – H330

Hazard statements:

H225 – Highly flammable liquid and vapour.

H301 – Toxic if swallowed.

H314 – Causes severe skin burns and eye damage.

H330 – Fatal if inhaled.

2.2. Label elements:

IUPAC name: Ethyl chloroformate
CAS number: 541-41-3
EC number: 208-778-5



Hazard statements:

H225 – Highly flammable liquid and vapour.
H301 – Toxic if swallowed.
H314 – Causes severe skin burns and eye damage.
H330 – Fatal if inhaled.

Precautionary statements:

P210 – Keep away from heat, sparks, open flame and hot surfaces. No smoking.
P233 – Keep container tightly closed.
P243 – Take precautionary measures against static discharge.
P280 – Wear protective gloves/protective clothing/eye protection/face protection.
P284 – [In case of inadequate ventilation] wear respiratory protection.
P260 – Do not breathe dust/fume/gas/mist/vapours/spray.
P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 – Immediately call a POISON CENTER or a doctor.
P304 + P340 – IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P363 – Wash contaminated clothing before reuse.
P303 + P361 + P353 – IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P403 + P235 – Store in a well-ventilated place. Keep cool.
P405 – Store locked up.
P501 – Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3. Other hazards:

Information concerning specific hazards for human and environment: See Sections 11-12.
The substance does not meet the criteria for PBT or vPvB substances according to Annex XIII of Regulation 1907/2006/EC.
Endocrine disrupting property: Not an endocrine disruptor.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance:

IUPAC name: Ethyl chloroformate
Synonym: Chloroformate ethyl ester; Ethyl chlorocarbonate
CAS number: 541-41-3
EC number: 208-778-5
Formula: $C_3H_5ClO_2$
Molar mass: 108.5 g/mol
Purity: > 99.6 %

Other hazardous additives / Concentration: the product contains phosgene and hydrochloric acid in traces.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures:

General information: Immediately remove contaminated clothing. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). First aid personnel should pay attention to their own safety.

INGESTION:

Measures:

- Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

INHALATION:

Measures:

- Take the victim into fresh air, loosen his clothes, let him rest and protect from cooling down.
- Administering oxygen may be required.
- Obtain immediate medical attention and show him the label or this safety data sheet.

SKIN CONTACT:

Measures:

- Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

EYE CONTACT:

Measures:

- Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

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

See section 11 for information on health effects and symptoms.

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

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote, administer corticosteroid dose aerosol to prevent pulmonary oedema. Medical monitoring for at least 24-48 hours.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media:

5.1.1. Suitable extinguishing media:

Dry powder, alcohol-resistant foam, carbon dioxide.

5.1.2. Unsuitable extinguishing media:

Water.

5.2. Special hazards arising from the substance or mixture:

Highly flammable liquid and vapour.

In case of fire, smoke and other combustion products (hydrogen chloride, phosgene, carbonyl chloride, carbon oxides, halogenated compounds) may be formed; the inhalation of such combustion products can have serious adverse effects on health.

5.3. Advice for firefighters:

Wear full protective clothing and self-contained breathing apparatus.

Suppress gases/vapours/mists with water spray.

Fire debris must be disposed of in accordance with official regulations.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:

6.1.1. For non-emergency personnel:

Allow only well-trained experts wearing suitable protective clothing to abide in the field of the accident.

6.1.2. For emergency responders:

Wear a self-contained breathing apparatus.

Avoid contact with the skin, eyes and clothing.

Keep people away and stay on the upwind side.

6.2. Environmental precautions:

Dispose of the spillage and the resulting waste according to the applicable environmental regulations. Do not allow the product and the resulting waste to enter sewers/soil/surface or ground water. Notify the respective authorities in accordance with local law in the case of environmental pollution immediately.

Discharge into the environment must be avoided.

6.3. Methods and material for containment and cleaning up:

For large amounts: Pump off product. Dispose of absorbed material in accordance with regulations.

For residues: Pick up with suitable absorbent material. Dispose of absorbed material in accordance with regulations.

6.4. Reference to other sections:

For further and detailed information see Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling:

Observe conventional hygiene precautions.

Protect against moisture.

In case of insufficient ventilation, wear suitable respiratory equipment.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Use adequate personal protective equipment (see section 8).

The contaminated clothes should be removed immediately and should be cleaned before re-use.

After the handling of the product and before breaks or before eating wash your hands, after the work hours thorough washing (warm water hand washing and showering with soap) is required.

Technical measures:

Ensure thorough ventilation of stores and work areas (general ventilation and local suction).

Use only in enclosed systems.

Adequate extraction of vapours is necessary when working with open containers.

Precautions against fire and explosion:

Keep away from heat, sparks, open flame and hot surfaces. No smoking.

Take precautionary measures against static discharges.

Avoid the formation of flammable and explosive vapours, use spark and explosion proof equipment/tools during the handling.

During the transferring, the fire protection rules have to be observed strictly. Appropriate earthing is needed.

Attention, the emptied containers may contain flammable liquid or vapour residues.

It is forbidden to put the emptied containers under pressure, to cut, weld or braze, drill, grind or sand them.

7.2. Conditions for safe storage, including any incompatibilities:

Technical measures and storage condition:

Keep only in the original container in a dry (protected from water and humidity), cool, well-ventilated place away from ignition sources, heat or flame.

Protect from direct sunlight.

Frequently check condition of drums (increase in pressure, bulging, rust).

Product has to be immediately consumed or disposed of, if signs of pressure increase or bulging are being detected at a drum.

If the stated storage temperature is exceeded the shelf life can be reduced.

Improper storage may result in pressure build up in the drums.

Storage stability is based upon ambient temperatures and conditions described.

The place of storage has to be properly ventilated and cleanable.

Follow all instructions on the label.

Do not smoke in the place and the vicinity of the storage.

Incompatible materials: incompatible with strong oxidants (in case of contact: fire- and explosion hazard). Reacts with alkalis, water, amines and alcohols.

Storage temperature: < 20 °C

Incompatible materials: See Section 10.5

Packaging material: The product must be stored in properly coated (lined with polyethylene or with inert material) and tightly sealed metal drum. It is forbidden to use other packaging material or packaging material made of other material or metal drum without polyethylene line!

7.3. Specific end use(s):

No specific instructions available.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

Occupational exposure limit values (Commission Directive (EC) No 2000/39 of 8 June 2000):

The substance is not regulated with exposure limit value.

The product contains phosgene in traces.

Phosgene; carbonyl chloride (CAS: 75-44-5):

TWA value 0.08 mg/m³; 0.02 ppm (OEL (EU))

STEL value 0.4 mg/m³; 0.1 ppm (OEL (EU))

PNEC values:

Freshwater: 0.19 mg/l

Freshwater – intermittent release: 20 mg/l

Marine water: 0.096 mg/l

STP: 10 mg/l

Freshwater sediment: 0.397 mg/kg sediment dry weight

Soil: 0.029 mg/kg soil dry weight

DNEL values		Oral exposure		Dermal exposure		Inhalative exposure	
		Short term (acute)	Long term (chronic)	Short term (acute)	Long term (chronic)	Short term (acute)	Long term (chronic)
Consumer	Local	no data	no data	no data	no data	no data	no data
	Systemic	no data	no data	no data	no data	no data	no data
Worker	Local	no data	no data	no data	no data	no data	no data
	Systemic	no data	no data	no data	no data	no data	no data

8.2. Exposure controls:

In case of a hazardous material with no controlled concentration limit it is the employer's duty to keep concentration levels down to a minimum achievable by existing scientific and technological means, where the hazardous substance poses no harm to workers.

8.2.1. Appropriate engineering controls:

In pursuance of work is proper foresight needed to avoid spilling onto clothes and floors and to avoid contact with eyes and skin.

Ensure efficient ventilation (general ventilation and local exhaust) in the workplace to avoid harmful exposure and to keep the concentration of the airborne contaminants under the permissible limit value.

Electrical equipment should be sparking and explosion proof.

Keep away all heat and ignition sources.

Do not eat or smoke during the processing.

Wash thoroughly after the work hours.

In the vicinity of the workplace safety shower and eye wash fountain has to be installed.

8.2.2. Individual protection measures, such as personal protective equipment:

Avoid contact with the skin, eyes and clothing. Avoid inhalation of vapour.

The substance was registered as a transported isolated intermediate. The manufacturer/importer has received the confirmation by the user that the substance is used under strictly controlled conditions in accordance with art. 18 of the REACH regulation (EC) No 1907/2006.

1. **Eye/face protection:** Use appropriate tightly fitting protective glasses and face protection (EN 166).

2. **Skin protection:**

a. **Hand protection:** Use appropriate chemical resistant protective gloves (EN 374). Suitable materials for short-term contact and/or splashes (recommended: At least protective index 2, corresponding > 30 minutes of permeation time according to EN 374):

- butyl rubber (butyl) - 0.7 mm thickness

- fluoroelastomer (FKM) - 0.7 mm thickness

The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing. Manufacturer's directions for use should be observed because of great diversity of types.

b. **Other:** Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

3. **Respiratory protection:** Wear respiratory protection if gases/vapours are formed (gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A)). Suitable respiratory protection for higher concentrations or long-term effect: self-contained breathing apparatus.
4. **Thermal hazards:** No thermal hazards known.

8.2.3. **Environmental exposure controls:**

No specific prescription.

The requirements detailed in Section 8 assume skilled work under normal conditions and usage of the product for appropriate aims. If conditions differ from normal or work is carried out under extreme conditions, an expert's advice is necessary before deciding upon further protective measures.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. **Information on basic physical and chemical properties:**

Parameter	Value / Test method / Remarks
1. Physical state	liquid / 20 °C, 1013 hPa
2. Colour	colourless, clear
3. Odour, odour threshold	sharp, like hydrochloric acid
4. Melting point/freezing point	-80.6 °C
5. Boiling point or initial boiling point and boiling range	95 °C / 1013 hPa
6. Flammability	highly flammable
7. Lower and upper explosion limit	no data*
8. Flash point	16 °C / 1013 hPa
9. Auto-ignition temperature	500 °C
10. Decomposition temperature	no data*
11. pH	no data*
12. Kinematic viscosity	no data*
13. Solubility in water	no data*
in other solvents	no data*
14. Partition coefficient n-octanol/water (log value)	no data*
15. Vapour pressure	55 hPa / 20 °C
16. Density and/or relative density	relative density: 1.14 / 20 °C
17. Relative vapour density	no data*
18. Particle characteristics	no data*

9.2. **Other information:**

9.2.1. **Information with regard to physical hazard classes:**

Oxidizing properties: No oxidizing properties.

9.2.2. **Other safety characteristics:**

Dynamic viscosity: 0.557 mPa.s (20 °C)

*: The manufacturer did not carry out any tests on this parameter for the product or the results of the tests are not available at the time of publication of the data sheet, or the property is not applicable for the product.

SECTION 10: STABILITY AND REACTIVITY

10.1. **Reactivity:**

Corrodes metals in the presence of water.

Reaction with: air.

Reacts with alkalis, amines and alcohols.

In case of contact with water, decomposes.

10.2. **Chemical stability:**

Even when products are stored appropriately a slow decomposition reaction takes place. If the storage conditions and duration are taken into account, no hazard is caused by the product.

Stable at room temperature and general conditions of work.

10.3. Possibility of hazardous reactions:

At elevated temperatures gas forming exothermic decomposition reaction may occur. The formation of gaseous decomposition products builds up pressure in tightly closed containers if the product is greatly overheated. Evolution of corrosive gases/vapours. Reacts with water and basic components to generate heat. Reacts with activated carbon. Reacts with alkalis and metals. Reacts with alcohols, amines, aqueous acids and alkalis. Reacts with water and moisture, with formation of hydrogen chloride. Partly very violent reactions with bases and numerous organic classes of substances such as alcohols and amines. Impurities promote decomposition. Energy is released when reacting with e.g. acids, alkaline reacting substances, amines or catalysts. ppm traces of heavy metals reduce the onset temperature and lead to instability and exothermic product release with gas formation. Vapours may form ignitable mixture with air.
Reacts with alkalis, amines and alcohols.
In case of contact with water, decomposes.

10.4. Conditions to avoid:

Temperature: > 39 °C

Avoid all sources of ignition: heat, sparks, open flame. Avoid direct sunlight. Avoid electro-static charge. Avoid humidity. Avoid heat. Avoid prolonged storage. Disregard of the conditions mentioned may result in undesirable decomposition reactions. Avoid excessive temperatures. Avoid contamination.

Ignition sources, moisture, contact with air or water, heat, electric sparks.

10.5. Incompatible materials:

Alkaline reactive substances, alcohols, bases, amines, iron compounds, heavy metal salts, water.

Incompatible with strong oxidants (in case of contact: fire- and explosion hazard).

10.6. Hazardous decomposition products:

Chloroethane, hydrogen chloride, carbon dioxide, methanol, carbon monoxide, and hydrochloric acid.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008:

Acute toxicity: Toxic if swallowed. Fatal if inhaled.

Skin corrosion/irritation: Causes severe skin burns and eye damage.

Serious eye damage/irritation: Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation: Based on available data, the classification criteria are not met.

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.

11.1.1. Summaries of the information derived from the test conducted:

No data available.

11.1.2. Relevant toxicological properties:

Acute toxicity:

LD₅₀ (oral, rat, male/female): ca. 205 mg/kg bw

LD₅₀ (dermal, rabbit, male): > 2280 mg/kg bw

LC₅₀ (inhalation, vapour, rat, male): 0.84 mg/l air/1h (analytical)

LC₅₀ (inhalation, vapour, rat, female): 0.89 mg/l air/1h (analytical)

Skin corrosion/irritation:

Erythema score: 2.6 (1h, not reversible)

Oedema score: 1.9 (1h, not reversible)

Serious eye damage/eye irritation:

Corrosive.

Repeated dose toxicity:

NOAEL (inhalation, vapour, rat, male/female): 1 ppm

LOAEC (inhalation, vapour, rat, male/female): 5 ppm

Genetic toxicity, in vivo:

S. typhimurium: negative

Carcinogenicity:

NOAEL (dermal, mouse): 5.5 mg/treatment

11.1.3. Information on likely routes of exposure:

Ingestion, inhalation, skin contact, eye contact.

11.1.4. Symptoms related to the physical, chemical and toxicological characteristics:

Acute effects:

Corrosive, may cause burning.

Ingestion: harmful if ingested, causes gastrointestinal irritation with nausea, vomiting and diarrhea.

Burning may occur in the gastrointestinal tract.

Symptoms of poisoning: Stomach convulsion, stomachache, weakness, burning feeling, coughing, labored breath, nausea, sore throat.

Inhalation: may cause fatal poisoning. The product may cause burning in the respiratory tract.

Respiratory tract irritation, later (after some hours) pulmonary edema may occur.

Symptoms of poisoning: Burning feeling, coughing, labored breath, nausea, sore throat.

Symptoms in case of skin contact: burning, burning feeling, pain, blistering.

Eye contact: lachrymatory agent. May cause severe eye irritation and burns.

Symptoms of poisoning: Eye reddening, pain, serious and deep burns.

Irritation: may cause skin and mucous membrane irritation, burning. Causes gastrointestinal irritation.

May cause respiratory tract irritation.

Sensitization: after the contact skin sensitization may occur, the allergic reaction becomes evident after the repeated exposition.

11.1.5. Delayed and immediate effects as well as chronic effects from short and long-term exposure:

Toxic if swallowed.

Causes severe skin burns and eye damage.

Fatal if inhaled.

11.1.6. Interactive effects:

No data available.

11.1.7. Absence of specific data:

No information.

11.2. Information on other hazards:

Endocrine disrupting properties:

Endocrine disrupting property: Not an endocrine disruptor.

Other information:

No data available.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity:

The substance is not classified as hazardous for the environment.

Short-term toxicity to fish:

LC₅₀ (Pimephales promelas): 14200 mg/l/96h

Short-term toxicity to aquatic invertebrates:

EC₅₀ (Ceriodaphnia dubia): 5012 mg/l/48h

Long-term toxicity to aquatic invertebrates:

NOEC (Ceriodaphnia dubia): 9.6 – 16 mg/l/9 days

Toxicity to aquatic algae and cyanobacteria:

EC₅₀ (Chlorella vulgaris): ca. 1000 mg/l/96h

Toxicity to aquatic plants other than algae:

EC₅₀ (Lemna gibba): 4432 mg/l/7 days

Toxicity to microorganisms:

EC₅₀ (activated sludge): > 1000 mg/l/3h

12.2. Persistence and degradability:

The substance is readily biodegradable.

12.3. Bioaccumulative potential:

No data available.

12.4. Mobility in soil:

The very low K_{oc} indicates no significant adsorption of ethanol to soils.

The Henry's Law constant of 0.6037 Pa m³/mol at 15 °C indicates that from the water surface the substance will not evaporate into the atmosphere.

12.5. Results of PBT and vPvB assessment:

The substance does not meet the criteria for PBT or vPvB substances.

12.6. Endocrine disrupting properties:

Endocrine disrupting property: Not an endocrine disruptor.

12.7. Other adverse effects:

No data available.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods:

Disposal according to the local regulations.

13.1.1. Information regarding the disposal of the product:

Incinerate in suitable incineration plant, observing local authority regulations.

Hydrolysis with alkali/ammonia solution in water.

Esterification with methanol and afterwards incineration in a suitable incineration facility.

The product can be incinerated in a chemical incinerator equipped with an afterburner and scrubber.

List of Waste Code:

No waste disposal key according to the List of Waste Code (LoW code) can be determined for this product, as only the purpose of application defined by the user enables an allocation. The LoW code number has to be determined after a discussion with a waste disposal specialist.

13.1.2. Information regarding the disposal of the packaging:

Be careful when handling empty packing which is not decontaminated and rinsed.

Decontamination of product residues with sodium hydroxide solution/ammonia solution in water.

Thermal recycling of the cleaned drums.

According to the consideration regarding the product.

The contaminated packaging should be cleaned with alkaline solution.

13.1.3. Physical/chemical properties that may affect waste treatment options shall be specified:

No data available.

13.1.4. Sewage disposal:

No data available.

13.1.5. Special precautions for any recommended waste treatment:

No data available.

SECTION 14: TRANSPORT INFORMATION

14.1. UN number or ID number:

UN 1182

14.2. UN proper shipping name:

ETHYL CHLOROFORMATE

14.3. Transport hazard class(es):

ADR/RID: 6.1 TFC

Labels: 6.1. + 3 + 8

IMDG: 6.1

IATA: -

14.4. Packing group:

ADR/RID: I

IMDG: I

IATA: -

14.5. Environmental hazards:

ADR/RID: No

IMDG: No

IATA: -

14.6. Special precautions for user:

Air transport: FORBIDDEN.

14.7. Maritime transport in bulk according to IMO instruments:

Not applicable.

SECTION 15: REGULATORY INFORMATION

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

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive (EC) No 1999/45 and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive (EEC) No 76/769 and Commission Directives (EEC) No 91/155, (EEC) No 93/67, (EC) No 93/105 and (EC) No 2000/21

REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives (EEC) No 67/548 and (EC) No 1999/45, and amending Regulation (EC) No 1907/2006

COMMISSION REGULATION (EU) 2020/878 of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

15.2. Chemical safety assessment: No information.

SECTION 16: OTHER INFORMATION

Information regarding the revision of the safety data sheet:

The safety data sheet has been revised according to Regulation (EU) 2020/878 (Section 1-16).
The hazard classification of the substance did not change compared to the previous version.

This safety data sheet supersedes all previous versions according to Annex II of Regulation (EC) No 1907/2006.

Literature references / data sources:

Previous version of the safety data sheet (26. 09. 2018, version CLP_E).

Relevant hazard statements (code and full text) of Sections 2 and 3:

H225 – Highly flammable liquid and vapour.

H301 – Toxic if swallowed.

H314 – Causes severe skin burns and eye damage.

H330 – Fatal if inhaled.

Training advice: No data available.

Full text of the abbreviations in the safety data sheet:

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.

ADR: Agreement concerning the International Carriage of Dangerous Goods by Road.

ATE: Acute Toxicity Estimate.

AOX: Adsorbable organic halides.

BCF: Bioconcentration factor.

BOD: Biological Oxygen Demand.

CAS number: Chemical Abstract Service number.

CLP: Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures.

CMR effects: Carcinogenic, mutagenic, reprotoxic effects.

COD: Chemical Oxygen Demand.

CSA: Chemical Safety Assessment.

CSR: Chemical Safety Report.

DNEL: Derived-No-Effect-Level.

ECHA: European Chemical Agency.

EC: European Community.

EC number: EINECS and ELINCS numbers (see also EINECS and ELINCS).

EEC: European Economic Community.

EEA: European Economic Area (EU + Iceland, Liechtenstein and Norway).

EINECS: European Inventory of Existing Commercial Chemical Substances.

ELINCS: European List of Notified Chemical Substances.

EN: European Norm.
EU: European Union.
EWC: European Waste Catalogue (replaced by LoW – see below).
GHS: Globally Harmonized System of Classification and Labelling of Chemicals.
IATA: International Air Transport Association.
ICAO-TI: Technical Instructions for the Safe Transport of Dangerous Goods by Air.
IMDG: International Maritime Dangerous Goods.
IMO: International Maritime Organization.
IMSBC: International Maritime Solid Bulk Cargoes.
IUCLID: International Uniform Chemical Information Database.
IUPAC: International Union of Pure and Applied Chemistry.
Kow: n-Octanol - Water Partition Coefficient.
LC₅₀: Lethal concentration resulting in 50 % mortality.
LD₅₀: Lethal dose resulting in 50 % mortality (median lethal dose).
LoW: List of Waste.
LOEC: Lowest Observed Effect Concentration.
LOEL: Lowest Observed Effect Level.
NOEC: No Observed Effect Concentration.
NOEL: No Observed Effect Level.
NOAEC: No Observed Adverse Effect Concentration.
NOAEL: No Observed Adverse Effect Level.
OECD: Organization for Economic Cooperation and Development.
OSHA: Occupational Safety and Health Administration.
PBT: Persistent, Bioaccumulative and Toxic.
PNEC: Predicted No Effect Concentration.
QSAR: Quantitative Structure Activity Relationship.
REACH: Regulation 1907/2006/EC concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals.
RID: Regulations Concerning the International Transport of Dangerous Goods by Rail.
SCBA: Self Contained Breathing Apparatus.
SDS: Safety Data Sheet.
STOT: Specific Target Organ Toxicity.
SVHC: Substances of Very High Concern.
UN: United Nations.
UVCB: Chemical Substances of Unknown or Variable Composition, Complex Reaction Products and Biological Materials.
VOC: Volatile Organic Compound.
vPvB: very Persistent and very Bioaccumulative.

This safety data sheet had been prepared on the basis of information provided by the manufacturer/supplier and conform to the relevant regulations.

The information, data and recommendations contained herein are provided in good faith, obtained from reliable sources and believed to be true and accurate as of the date issued; however, no representation is made as to the comprehensiveness of the information.

The SDS shall be used only as a guide for handling the product; in the course of handling and using the product other considerations may arise or be required.

Users are cautioned to determine the appropriateness and applicability of the above information to their particular circumstances and purposes and assume all risk associated with the use of this product.

It is the responsibility of the user to fully comply with local, national and international regulations concerning the use of this product.

Safety data sheet was prepared by:
MSDS-Europe
International branch of ToxInfo Kft.

Professional help regarding the explanation of
the safety data sheet:
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www.msds-europe.com

