

FramoChem

A VanDeMark Company

SAFETY DATA SHEET

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

- 1.1. Product identifier:
Ethyl chloroformate
- IUPAC name: Ethyl chloroformate
Synonym: Chlorformate ethyl ester
CAS number: 541-41-3
EU 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 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 str. 5., POB. 504
Telephone: +36 (48) 311-991
Fax: +36 (48) 512-162
- 1.3.1. Responsible person: -
E-mail: info@framochem.hu
- 1.4. Emergency telephone number: **Public Toxicological Health Service (ETTSZ)**
1096 Budapest, Nagyvárad tér 2.
Tel.: 06 1 476 6464, 06 80 201 199 (0-24 h)

SECTION 2: HAZARDS IDENTIFICATION

- 2.1. Classification of the substance:
- Classification according to Regulation 1272/2008/EC (CLP):
Flam. Liq. 2 - H225
Acute Tox. 4 (oral) - H302
Skin Corr. 1B - H314
Acute Tox. 2 (inhalative) - H330
- Warning H statements:**
H225 - Highly flammable liquid and vapour.
H302 - Harmful if swallowed.
H314 - Causes severe skin burns and eye damage.
H330 - Fatal if inhaled.
- Classification according to Directive 67/548/EEC:
T+; Very toxic - R26
F; Highly flammable - R11
Xn; Harmful - R22
C; Corrosive - R34
- R phrases** referring to the hazards/risks:
R 11 - Highly flammable
R 22 - Harmful if swallowed.
R 26 - Very toxic by inhalation

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R 34 - Causes burns.

2.2. Label elements

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



DANGER

Warning **H statements**:

H225 - Highly flammable liquid and vapour.
H302 - Harmful if swallowed.
H314 - Causes severe skin burns and eye damage.
H330 - Fatal if inhaled.

Precautionary **P statements**:

P210 - Keep away from heat, sparks, open flame and hot surfaces. No smoking.
P243 - Take precautionary measures against static discharge.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P284 - Wear respiratory 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.
P310 - Immediately call a POISON CENTER or doctor/physician.
P403 - Store in a well-ventilated place.
P405 - Store locked up.

2.3. Other hazards:

The substance does not meet the PBT criteria according to Annex XIII of Regulation 1907/2006/EC.
Information concerning specific hazards for human and environment: see Section 11.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

IUPAC name: Ethyl chloroformate
Synonym: Chloroformate ethyl ester
CAS number: 541-41-3
EU number 208-778-5
Formula: C₃H₅ClO₂
Molar weight: 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:

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GENERAL INFORMATION: Immediately remove the injured person from the exposition.

INFORMATION TO THE PHYSICIAN: Life threatening poisoning can happen, pulmonary edema may occur.

IN CASE OF INGESTION:

Measures:

- Obtain immediate medical help.
- Show the label or the safety data sheet to the physician.
- Do not give the victim anything to eat or drink, and do not induce vomiting if the victim is unconscious.
- Do not induce vomiting.
- If the victim is conscious, flush the mouth and give him 1-2 glasses of water to drink.

IN CASE OF 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.

IN CASE OF SKIN CONTACT:

Measures:

- Remove the contaminated clothes and shoes.
- Immediately wash the contaminated area with plenty of flowing water and soap (for 15 minutes).
- For the first-aiders it is recommended to wear protective equipment (protective gloves).
- Wash contaminated clothing before reuse.

IN CASE OF EYE CONTACT:

Measures:

- In case of contact with eyes flush with plenty of flowing water holding eyelids apart and moving the eyeballs (for at least 15 minutes).
- Obtain immediate ophthalmologist help.

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:**

See section 11 for information on health effects and symptoms.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. **Extinguishing media:**

5.1.1. **Suitable extinguishing media:**

Alcohol resistant foam, dry powder, carbon dioxide.

5.1.2. **Unsuitable extinguishing media:**

Avoid the use and contact with water, it is forbidden to direct the water jet into the fire.

5.2. **Special hazards arising from the substance or mixture:**

In case of fire, smoke and other combustion products (carbon dioxide, carbon monoxide and hydrogen chloride) may be formed, the inhalation of such combustion products can have serious adverse effects on health.

5.3. **Advise for fire fighters**

Wear appropriate full protective clothing and self-contained breathing apparatus (self-rescue breathing apparatus). These means can protect from the skin and eye contact and from the inhalation of the hazardous gases and smoke.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. **Personal precautions, protective equipment and emergency procedures:**

6.1.1. **For non-emergency personnel:**

Keep unprotected people away, allow only well trained experts wearing suitable protective clothing to abide in the field of accident.

6.1.2. **For emergency responders:**

Evacuate the unauthorized persons from the place of the accident. Remove all ignition sources from the affected area. Close the designated area. Ensure adequate ventilation.

6.2. **Environmental precautions:**

Dispose of spillage and waste (product/packaging) in accordance with all applicable environmental laws. Do not allow the substance 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.

6.3. **Methods and material for containment and cleaning up:**

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Collect the spilled material with inert, non-combustible, mineral absorbent (sand, earth, perlite), then place into a suitable, closed, properly labelled chemical waste container for disposal. During disposal wear suitable personal protective equipment.

- 6.4. Reference to other sections:
For further and detailed information see section 8 and 13.

SECTION 7: HANDLING AND STORAGE

- 7.1. Precautions for safe handling:
Observe conventional hygiene precautions.
Avoid contact of the material with skin, eyes and clothing.
Do not eat, drink and smoke in the workplace.
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 adequate ventilation (general ventilation and local suction).
Precautions against fire and explosion:
The use/handling of the product must be far from heat and ignition sources, avoid the sparking and use of open flame, avoid electrostatic charge.
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. Keep away from heat, sparks, open flame.
- 7.2. Conditions for safe storage, including any incompatibilities:
Technical measures and storage condition:
Keep in original, closed and appropriately labelled container.
The place of storage has to be properly ventilated and cleanable.
Store in cool, dry (protected from water and humidity), well-ventilated place.
Follow all instructions on the label.
Keep away from heat and ignition sources (sparkling tools and open flame) and incompatible substances.
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.
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:

Exposure limit values:
The substance is not regulated with exposure limit value.

DNEL		Routes of exposure	Exposure frequency	Remarks:
Worker	Consumer			
no data available	no data available	Dermal	Short term (acute) Long term (repeated)	no data available
no data available	no data available	Inhalative	Short term (acute) Long term (repeated)	no data available
no data available	no data available	Oral	Short term (acute) Long term (repeated)	no data available

PNEC			Exposure frequency	Remarks:
Water	Soil	Air		

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0.19 mg/l	0.029 mg/kg	no data available	Short term (single use) Long term (continuous)	no data available
no data available	no data available	no data available	Short term (single use) Long term (continuous)	no data available
no data available	no data available	no data available	Short term (single use) Long term (continuous)	no data available

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:

1. Eye/face protection: use appropriate protective glasses/protective mask according to EN 166.
2. Skin protection:
 - a. Hand protection: use appropriate protective gloves according to EN 374.
 - b. Other: use appropriate, acid resistant protective clothes according to EN ISO 6529.
3. Respiratory protection: use adequate respirator (for organic vapours) according to EN 136, EN 141.
4. Thermal hazard: None known.

8.2.3 Environmental exposure controls:

No special measures required.

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 should be sought out before deciding upon further protective measures.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties:

Parameter	Test method:	Remarks:
1. Appearance:		
	colourless, clear liquid	
2. Odour:	pungent	
3. Odour threshold:	no data available	
4. pH value:	not applicable	
5. Melting point/ freezing point:	- 81 °C	
6. Initial boiling point/boiling range:	95 °C	
7. Flash point:	16 °C	closed cup
8. Evaporation rate:	no data available	
9. Flammability:	Class A, degree I, T1	
10. Upper/lower flammability or explosive limits:	lower: 3.52 vol. % upper: 10.19 vol. %	explosion limits
11. Vapour pressure:	55 x 10 ² Pa	25 °C
	103 x 10 ³ Pa	100 °C
12. Vapour density:	3.7	air = 1
13. Relative density:	no data available	

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14. Solubility(ies):	In case of contact with water, decomposes. Soluble in organic solvents.
15. Partition coefficient: n-octanol/water:	not applicable
16. Self-ignition temperature:	500 °C
17. Degradation temperature:	no data available
18. Viscosity:	0.557 mPas/20 °C
19. Explosive properties:	no data available
20. Oxidizing properties:	no data available
9.2. <u>Other information:</u> Density (20 °C): 1.14 g/cm ³	

SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:
Reacts with alkalis, amines and alcohols.
In case of contact with water, decomposes.
- 10.2. Chemical stability:
Stable at room temperature and general conditions of work.
- 10.3. Possibility of hazardous reactions:
Reacts with alkalis, amines and alcohols.
In case of contact with water, decomposes.
- 10.4. Conditions to avoid:
Ignition sources, moisture, contact with air or water, heat, electric sparks.
- 10.5. Incompatible materials:
Incompatible with strong oxidants (in case of contact: fire- and explosion hazard).
- 10.6. Hazardous decomposition products:
Carbon monoxide, carbon dioxide and hydrochloric acid.

SECTION 11: TOXICOLOGICAL INFORMATION

- 11.1. Information on toxicological effects
Acute toxicity: harmful if swallowed. Fatal if inhaled.
Skin corrosion/irritation: causes severe burns.
Serious eye damage/eye irritation: causes serious eye damage.
Respiratory or skin sensitization: none known.
Germ cell mutagenicity: none known.
Carcinogenicity: the substance is not listed in the list of carcinogen substances. Evidence of carcinogenicity is not available.
Reproductive toxicity: none known.
STOT-single exposure: none known.
STOT-repeated exposure: none known.
Aspiration hazard: none known.
- 11.1.1. For substances subject to registration, brief summaries of the information derived from the test conducted:
No data available.
- 11.1.2. Relevant toxicological properties of the hazardous substances:
Acute toxicity (LD₅₀):
LD₅₀ (oral, rat) value: 205 mg/kg.
- 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.

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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:

Harmful 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.

11.1.8. Other information:

No data available.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity:

No data available.

12.2. Persistence and degradability

No data available.

12.3. Bioaccumulation potential:

No data available.

12.4. Mobility in soil

Practically insoluble in water.

12.5. Results of PBT and vPvB assessment

This substance does not meet the criteria of PBT or vPvB.

12.6. 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:

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

European Waste Code:

No appropriate EWC code can be given for the substance, since the identification of the proper code can be done with the method of use defined by the user of the substance. The European waste code number has to be determined after a discussion with a specialist dealing with waste disposal.

13.1.2. Information regarding the disposal of the packaging:

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:

None known.

13.1.4. Sewage disposal:

None known.

13.1.5. Special precautions for any recommended waste treatment:

No data available.

SECTION 14: TRANSPORT INFORMATION

14.1. UN Number:

1182

14.2. UN proper shipping name:

ETHYL CHLOROFORMATE

14.3. Transport hazard class(es)

ADR/RID: 6.1 TFC

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- Labels: 6.1. + 3 + 8
IMDG: 6.1
IATA: -
- 14.4. Packaging group
ADR/RID: I
IMDG: I
IATA: -
- 14.5. Environmental hazard
ADR/RID: no
IMDG: no
IATA:-
- 14.6. Special precautions for user:
Air transport: FORBIDDEN.
- 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:
Not applicable.

SECTION 15: REGULATORY INFORMATION

- 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture:
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 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC
- 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 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
- COMMISSION REGULATION (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- 15.2. Chemical safety assessment: no information available.

SECTION 16: OTHER INFORMATION

Information regarding the revision of the safety data sheet:

The safety data sheet has been revised according to Regulation 453/2010/EU (Section 1-16).

The classification has been amended according to Regulation 1272/2008/EC (CLP) and its amendments.

Full text of the abbreviations in the safety data sheet:

DNEL: Derived no effect level. PNEC: Predicted no effect concentration. CMR effects: carcinogenicity, mutagenicity and toxicity for reproduction. PBT: Persistent, bioaccumulative and toxic. vPvB: very persistent and very bioaccumulative. n.d.: not defined. n.a.: not applicable.

Data sources: n.d

Relevant R-Phrases (number and full text) of Section 2 and 3:

R 11 - Highly flammable

R 22 - Harmful if swallowed.

R 26 - Very toxic by inhalation)

R 34 - Causes burns.

Relevant H-Phrases (number and full text) of Section 2 and 3:

H225 - Highly flammable liquid and vapour.

H302 - Harmful if swallowed.

H314 - Causes severe skin burns and eye damage.

H330 - Fatal if inhaled.

Training instructions: n.d.

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,

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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: ToxInfo Ltd.

Professional help regarding the explanation of the safety data sheet:
+36 70 335 8480; info@msds-europe.hu

Download of safety data sheet:

