SAFETY DATA SHEET

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

1.1. Product identifier:
1-CHLOROETHYL CHLOROFORMATE

IUPAC name: 1-chloroethyl chloroformate
CAS number: 50893-53-3
EU number: 256-834-2
Registration number: Registration number is not available for this substance since this substance or its use is exempted from registration based on Article 2 of REACH regulation, or registration is not necessary due to the annual tonnage band, or the registration is scheduled to a later registration date.

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 47 6 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. 3 – H226
Acute Tox. 4 (oral) – H302
Skin Irrit. 2 – H315
Eye Irrit. 2 - H319
STOT SE 3 - H335

Warning H statements:
H226 – Flammable liquid and vapour.
H302 – Harmful if swallowed.
H315 – Causes skin irritation.
H319 – Causes serious eye irritation.
H335 – May cause respiratory irritation.

Classification according to Directive 67/548/EEC:
Xi; Irritant – R36/37/38
Xn; Harmful – R22
R10
**R phrases** referring to the hazards/risks:
- **R 10** - Flammable.
- **R 22** - Harmful if swallowed.
- **R 36/37/38** - Irritating to eyes, respiratory system and skin.

### 2.2. Label elements

IUPAC name: 1-chloroethyl chloroformate  
CAS number: 50893-53-3  
EU number: 256-834-2

**WARNING**

**Warning H statements:**
- **H226** – Flammable liquid and vapour.
- **H302** – Harmful if swallowed.
- **H315** – Causes skin irritation.
- **H319** – Causes serious eye irritation.
- **H335** – May cause respiratory irritation.

**Precautionary P statements:**
- **P260** - Do not breathe gas/mist/vapours/spray.
- **P280** – Wear 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:

The substance meets the PBT criteria according to Annex XIII of Regulation 1907/2006/EC: No.
Information concerning specific hazards for human and environment: See Section 11.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1. Substance

IUPAC name: 1-chloroethyl chloroformate  
CAS number: 50893-53-3  
EU number: 256-834-2  
Formula: C₃H₄C₂O₂  
Molar weight: 143  
Purity: > 99.45

### SECTION 4: FIRST AID MEASURES

#### 4.1. Description of first aid measures:

**IN CASE OF INGESTION:**

- Obtain immediate medical attention and show him the label!
- Place the victim into comfortable position.
- Do not give the victim anything to eat or drink and do not induce vomiting if the victim is unconscious.

**IN CASE OF INHALATION:**

- Take the victim into fresh air, loosen his clothes and let him rest.

FRAMOCHEM FRENCH-HUNGARIAN FINE CHEMICALS LTD. 2 / 8  
1-CHLOROETHYL CHLOROFORMATE
If the victim is unconscious and breathing, place him into recovery position.
Obtain immediate medical attention and show him the label!

**IN CASE OF SKIN CONTACT:**
Measures:
- Remove the contaminated clothes.
- Wash the skin surface with plenty of water and soap (for 15 minutes).
- If symptoms occur, obtain immediate medical attention and show him the label.

**IN CASE OF EYE CONTACT:**
Measures:
- Flush with plenty of flowing water holding eyelids apart (for at least 15 minutes).
- In case of persistent symptoms, obtain medical help and show him the label.

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:
Dry chemical, carbon dioxide, foam.
5.1.2. Unsuitable extinguishing media:
Water.
5.2. **Special hazards arising from the substance or mixture:**
Hazardous decomposition products: smoke and other combustion products (carbon dioxide, carbon monoxide and hydrogen chloride). The inhalation of such combustion products can cause serious adverse effects on health!
5.3. **Advise for firefighters**
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 for 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:**
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 product with skin, eyes and clothing.
Technical measures:
Ensure adequate ventilation / local extraction.
Precautions against fire and explosion:
No specific prescription.
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 and dry place. Follow all instructions on the label. Incompatible materials: water, alcohols, amines, bases. Packaging material: polyethylene container or container lined with polyethylene. Do not use metal containers without lining.

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.

<table>
<thead>
<tr>
<th>DNEL</th>
<th>Routes of exposure</th>
<th>Exposure frequency:</th>
<th>Remarks:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worker</td>
<td>Worker</td>
<td>Dermal</td>
<td>Short term (acute)</td>
</tr>
<tr>
<td>no data available</td>
<td>no data available</td>
<td></td>
<td>Long term (repeated)</td>
</tr>
<tr>
<td>Consumer</td>
<td>Consumer</td>
<td>Dermal</td>
<td>Short term (acute)</td>
</tr>
<tr>
<td>no data available</td>
<td>no data available</td>
<td></td>
<td>Long term (repeated)</td>
</tr>
<tr>
<td>no data available</td>
<td>no data available</td>
<td>Inhalative</td>
<td>Short term (acute)</td>
</tr>
<tr>
<td>no data available</td>
<td>no data available</td>
<td></td>
<td>Long term (repeated)</td>
</tr>
<tr>
<td>no data available</td>
<td>no data available</td>
<td>Oral</td>
<td>Short term (acute)</td>
</tr>
<tr>
<td>no data available</td>
<td>no data available</td>
<td></td>
<td>Long term (repeated)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PNEC</th>
<th>Exposure frequency:</th>
<th>Remarks:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>Water</td>
<td>Short term (single use)</td>
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<tr>
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<td>no data available</td>
<td>Long term (continuous)</td>
</tr>
<tr>
<td>Soil</td>
<td>Soil</td>
<td>Short term (single use)</td>
</tr>
<tr>
<td>no data available</td>
<td>no data available</td>
<td>Long term (continuous)</td>
</tr>
<tr>
<td>Air</td>
<td>Air</td>
<td>Short term (single use)</td>
</tr>
<tr>
<td>no data available</td>
<td>no data available</td>
<td>Long term (continuous)</td>
</tr>
</tbody>
</table>

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/leaking onto clothes and floors and to avoid contact with eyes and skin. Do not eat or smoke during working. Observe conventional hygiene precautions. Ensure adequate ventilation. In the vicinity of the workplace safety shower and eye washing fountain has to be installed. Do not eat, drink or smoke when handling. Do not breathe vapours! Keep away from skin and eyes. After the work thorough washing and hand washing is necessary.

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 (made of PVC or synthetic rubber).
   b. Other: use adequate acid resistant protective clothes according to EN 369.
3. Respiratory protection: use adequate respirator (for organic vapours) according to EN 136, EN 141.

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 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:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test method:</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Appearance:</td>
<td>colourless liquid</td>
<td></td>
</tr>
<tr>
<td>2. Odour:</td>
<td>pungent</td>
<td></td>
</tr>
<tr>
<td>3. Odour threshold:</td>
<td>no data available</td>
<td></td>
</tr>
<tr>
<td>4. pH value:</td>
<td>not applicable</td>
<td></td>
</tr>
<tr>
<td>5. Melting point/freezing point:</td>
<td>-65°C</td>
<td></td>
</tr>
<tr>
<td>6. Initial boiling point/boiling range:</td>
<td>117 °C</td>
<td></td>
</tr>
<tr>
<td>7. Flash point:</td>
<td>45 °C</td>
<td></td>
</tr>
<tr>
<td>8. Evaporation rate:</td>
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<td></td>
</tr>
<tr>
<td>9. Flammability:</td>
<td>no data available</td>
<td></td>
</tr>
<tr>
<td>10. Upper/lower flammability or explosive limits:</td>
<td>no data available</td>
<td></td>
</tr>
<tr>
<td>11. Vapour pressure:</td>
<td>24x10² Pa (20°C); 600x10² Pa (100°C)</td>
<td></td>
</tr>
<tr>
<td>12. Vapour density:</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td>13. Relative density:</td>
<td>no data available</td>
<td></td>
</tr>
<tr>
<td>15. Partition coefficient:</td>
<td>n-octanol/water: not applicable</td>
<td></td>
</tr>
<tr>
<td>16. Self-ignition temperature:</td>
<td>no data available</td>
<td></td>
</tr>
<tr>
<td>17. Degradation temperature:</td>
<td>90°C</td>
<td></td>
</tr>
<tr>
<td>18. Viscosity:</td>
<td>no data available</td>
<td></td>
</tr>
<tr>
<td>19. Explosive properties:</td>
<td>no data available</td>
<td></td>
</tr>
<tr>
<td>20. Oxidizing properties:</td>
<td>no data available</td>
<td></td>
</tr>
</tbody>
</table>

9.2. Other information:
Density (20 °C): 1.294 kg/cm³

SECTION 10: STABILITY AND REACTIVITY
10.1. Reactivity:
At normal temperature and general conditions of work stable.
10.2. Chemical stability:
Stable at room temperature.
10.3. Possibility of hazardous reactions:
Reacts with water.
10.4. Conditions to avoid:
Contact with water.
10.5. Incompatible materials:
Bases, water, amines and alcohol.
10.6. Hazardous decomposition products:
In case of thermal decomposition: carbon monoxide, carbon dioxide and hydrochloric acid.

SECTION 11: TOXICOLOGICAL INFORMATION
11.1. Information on toxicological effects:
Acute toxicity: Harmful if swallowed.
Skin corrosion/irritation: causes skin irritation.
Serious eye damage/eye irritation: causes serious eye irritation.
Respiratory or skin sensitisation: none known.
Germ cell mutagenicity: none known.
Carcinogenicity: none known.
Reproductive toxicity: none known.

STOT—single exposure: may cause respiratory irritation.

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: 470 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:**
Irritates the mucous membranes. May cause pneumonia if inhaled.
Ingestion: harmful
Inhalation: May cause pneumonia if inhaled. The symptoms may be delayed.
Skin contact: irritating effect.
Eye contact: irritating effect.

**Irritation:** irritates the mucous membranes. Skin and eye irritation.

**Sensitization:** some chlorformates may cause sensitization.

**Sub-acute and chronic toxicity:**
Symptoms by intensive or prolonged exposition: none known.

11.1.5. Delayed and immediate effects as well as chronic effects from short and long-term exposure:
Harmful if swallowed.
Causes skin irritation.
Causes serious eye irritation.
May cause respiratory irritation.

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:**
No data available.

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:
2742

14.2. UN proper shipping name:
ADR/RID: CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (1-chloroethyl chloroformate)
IMDG: CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (1-chloroethyl chloroformate)
IATA: CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (1-chloroethyl chloroformate)

14.3. Transport hazard class(es)
ADR/RID: 6.1 TFC
IMDG: 6.1
IATA: 6.1

14.4. Packaging group
ADR/RID: II
IMDG: II
IATA: II

14.5. Environmental hazard
ADR/RID: no
IMDG: no
IATA: none

14.6. Special precautions for user:
No relevant information available.

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:

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:
Date of issue: 19.11.2002.
Date of revision: 15.01.2015.
Version: CLP_B

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: data provided by the manufacturer.

Relevant R-Phrases (number and full text) of Section 2 and 3:
R 10 - Flammable.
R 22 - Harmful if swallowed.
R 36/37/38 - Irritating to eyes, respiratory system and skin.

Relevant H-Phrases (number and full text) of Section 2 and 3:
H226 - Flammable liquid and vapour.
H302 - Harmful if swallowed.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H335 - May cause respiratory irritation.

Training advice: no data available.

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.