

## SAFETY DATA SHEET

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

- 1.1. Product identifier:  
**2-ethylhexyl chloroformate**
- Synonym: Chloroformic acid 2-ethylhexyl ester  
CAS number: 24468-13-1  
EU number: 246-278-9  
Registration number: 01-2119472148-35-0003; Transported isolated intermediate.
- 1.2. 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](mailto:info@framochem.hu)
- 1.4. Emergency telephone number: **Public Toxicological Health Service (ETTSZ)**  
1096 Budapest, Nagyváradi 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):  
Skin Irrit. 2 - H315  
Eye Irrit. 2 - H319  
Acute Tox. 1(inhalative) - H330  
STOT SE 3 - H335
- Warning H statements:**  
**H315** - Causes skin irritation.  
**H319** - Causes serious eye irritation.  
**H330** - Fatal if inhaled.  
**H335** - May cause respiratory irritation.
- Classification according to Directive 67/548/EEC:  
T+; Very toxic - R26  
Xi; Irritant - R 36/37/38
- R phrases** referring to the hazards/risks:  
**R 26** - Very toxic by inhalation  
**R 36/37/38** - Irritating to eyes, respiratory system and skin.

2.2. Label elements

IUPAC name: 2-ethylhexyl chloroformate  
CAS number: 24468-13-1

EU number: 246-278-9

GHS06



**DANGER**

**Warning H statements:**

- H315** – Causes skin irritation.  
**H319** – Causes serious eye irritation.  
**H330** – Fatal if inhaled.  
**H335** – May cause respiratory irritation.

**Precautionary P statements:**

- P280** – Wear protective gloves/protective clothing/eye protection/face protection.  
**P284** – Wear respiratory protection.  
**P304 + P340 + P310** – IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor.  
**P403** – Store in a well-ventilated place.

2.3. Other hazards:

No other known specific hazards for human or environment.  
The substance does not meet the criteria for PBT or vPvB substances.

**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**

3.1. Substance

IUPAC name: 2-ethylhexyl chloroformate  
CAS number: 24468-13-1  
EU number: 246-278-9  
Synonym: Chloroformic acid 2-ethylhexyl ester  
Formula: C<sub>9</sub>H<sub>17</sub>ClO<sub>2</sub>  
Molar mass: 192, 7  
Purity: >99, 7

**SECTION 4: FIRST AID MEASURES**

4.1. Description of first aid measures:

IN CASE OF INGESTION:

Measures:

- 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:

Measures:

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

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- Immediately remove the contaminated clothes.
- Immediately wash the contaminated area with plenty of flowing 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 for 15 minutes 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:

Powder, carbon dioxide, foam.

##### 5.1.2. Unsuitable extinguishing media:

Water.

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

In case of fire, smoke and other combustion products (hydrochloric acid) 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 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 till removal/disposal. During the collection/placement/disposal of the hazardous waste use appropriate 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.

Ensure adequate ventilation.

Avoid contact with skin, eyes and clothing, avoid inhalation.

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.

Precautions against fire and explosion:

No special measures required.

#### 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.

Keep away from moisture.

Incompatible materials: water, alcohols, amines, bases.

Packaging material: Metal container lined with polyethylene, with inert material or polyethylene container.

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.

<b>DNEL</b>		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

<b>PNEC</b>			Exposure frequency:	Remarks:
Water	Soil	Air		
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
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. Do not inhale the vapours.

Ensure adequate ventilation, especially in closed areas.

Do not eat or smoke during the processing.

Before the breaks and after the work hours wash thoroughly (hand and body).

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

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

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. <b>Appearance:</b>	colourless liquid		
2. <b>Odour:</b>	unpleasant		
3. <b>Odour threshold:</b>	no data available		
4. <b>pH value:</b>	hydrolyses	aqueous solution	
5. <b>Melting point/ freezing point:</b>	<-55 °C		
6. <b>Initial boiling point/boiling range:</b>	degrades before boiling		
7. <b>Flash point:</b>	86 °C /101 kPa	closed cup	
8. <b>Evaporation rate:</b>	no data available		
9. <b>Flammability:</b>	no data available		
10. <b>Upper/lower flammability or explosive limits:</b>	no data available		
11. <b>Vapour pressure:</b>	20 °C: 0,21 x 10 <sup>2</sup> Pa; 44 °C: 1 x 10 <sup>2</sup> Pa		
12. <b>Vapour density:</b>	6,6	air = 1	
13. <b>Relative density:</b>	no data available		
14. <b>Solubility(ies):</b>	reacts with water, soluble in common solvents.		
15. <b>Partition coefficient: n-octanol/water:</b>	n.a.		
16. <b>Self-ignition temperature:</b>	235°C		
17. <b>Degradation temperature:</b>	135 °C (ATD) E = 250 J/G		
18. <b>Viscosity:</b>	1,774mPas (20 °C)		
19. <b>Explosive properties:</b>	no data available		
20. <b>Oxidizing properties:</b>	no data available		

9.2. Other information:

Density (20 °C): 0,984 (water = 1)

**SECTION 10: STABILITY AND REACTIVITY**

10.1. Reactivity:

At normal temperature, under 70 °C: stabile at general conditions of work.

10.2. Chemical stability:

Stable at room temperature.

10.3. Possibility of hazardous reactions:

Reacts violently with water.

10.4. Conditions to avoid:

Contact with water. Strong heating.

10.5. Incompatible materials:

Bases, water, amines and alcohol.

10.6. Hazardous decomposition products:

In case of thermal decomposition: carbon dioxide, in case of hydrolysis: hydrochloric acid, carbon dioxide, and 2-ethylhexanol is formed.

**SECTION 11: TOXICOLOGICAL INFORMATION**

11.1. Information on toxicological effects:

Acute toxicity: fatal if inhaled.

Skin corrosion/irritation: causes skin irritation.

Serious eye damage/eye irritation: causes serious eye irritation.

Respiratory or skin sensitisation: some chlorformates may cause sensitization.

Germ cell mutagenicity: none known.

Carcinogenicity: the substance is not listed in the list of carcinogen substances.

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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:  
LD50 (oral, rat) value: 5400 mg/kg.  
LC50 (inhalative, rat): 0.27 mg/l/4h
- 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:**  
Ingestion: no data available.  
Inhalation: toxic if inhaled.  
Skin contact: irritating.  
Eye contact: irritating to eyes.
- 11.1.5. Delayed and immediate effects as well as chronic effects from short and long-term exposure:  
Causes skin irritation.  
Causes serious eye irritation.  
Fatal if inhaled.  
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 about the substance.  
The 2-ethylhexyl alcohol is slightly biodegradable.
- 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:  
Dispose according to the relevant regulations. 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:  
2748
- 14.2. UN proper shipping name:  
2-ETHYLHEXYL CHLOROFORMATE
- 14.3. Transport hazard class(es)  
ADR/RID: 6.1. TC1  
IMDG: 6.1  
IATA: 6.1
- 14.4. Packaging group  
II
- 14.5. Environmental hazard  
ADR/RID: no  
IMDG: no  
IATA: no
- 14.6. Special precautions for user:  
Labels: 6.1+8
- 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

COMMISSION REGULATION (EC) No 790/2009 of 10 August 2009 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures

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:

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**R 26** - Very toxic by inhalation  
**R 36/37/38** - Irritating to eyes, respiratory system and skin.

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

**H315** – Causes skin irritation.  
**H319** – Causes serious eye irritation.  
**H330** – Fatal if inhaled.  
**H335** – May cause respiratory irritation.

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, 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 Kft.

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

Download of safety data sheet:

