1. IDENTIFICATION OF SUBSTANCE/PREPARATION AND THE COMPANY UNDERTAKING

Chemical Name: 1-Chloroethyl chloroformate
Product Code: FC37050
Synonyms:
Recommended uses: For R&D purposes
Supplier: Carbosynth Ltd, 8&9 Old Station Business Park, Compton, Berkshire, RG20 6NE, UK.
Emergency contact numbers:
  Telephone: +44 (0)1635 578 444
  Fax: +44 (0)1635 579 444
  Mobile: +44 (0)7887 998 634

2. HAZARDS IDENTIFICATION

Flammable. Harmful if swallowed. Toxic by inhalation. Causes burns.

Classification:

Flammable liquids (Category 3)
Acute toxicity, oral (Category 4)
Skin corrosion (Category 1B)
Acute toxicity, inhalation (Category 3)

Labelling and precautionary statements:

Pictogram: ![](image)

Signal word: Danger.

Hazard statement(s):
  H226 Flammable liquid and vapour.
  H302 Harmful if swallowed.
  H314 Causes severe skin burns and eye damage.
  H331 Toxic if inhaled.

Precautionary statement(s):
  P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Hazard symbol(s): T Toxic.

R-phrase(s):
  R10 Flammable.
  R22 Harmful if swallowed.
MATERIAL SAFETY DATA SHEET

1-CHLOROETHYL CHLOROFORMATE

R23  Toxic by inhalation.
R34  Causes burns.

S-phrase(s):
S16  Keep away from sources of ignition - No smoking.
S23  Do not breathe vapour.
S26  In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39  Wear suitable protective clothing, gloves and eye/face protection.
S45  In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S63  In case of accident by inhalation, remove casualty to fresh air and keep at rest.

Other hazards:  Lachrymator (substance which increases the flow of tears).

3. COMPOSITION/INFORMATION ON INGREDIENTS

Molecular Formula:  C₃H₅Cl₂O₄
Molecular weight:  142.97
CAS Number:  50893-53-3
EINECS Number:  256-834-2

4. FIRST AID MEASURES

Eye contact:  Immediately flush eye with copious amounts of water for at least 30 minutes. Get medical aid immediately.
Skin contact:  In case of contact remove contaminated clothing and immediately wash affected areas with copious quantities of water and soap for at least 30 minutes. Get medical aid immediately. Wash contaminated clothing before reuse.
Inhalation:  Remove to fresh air. If not breathing give artificial respiration. If breathing is difficult give oxygen. Get medical aid.
Ingestion:  Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Wash out mouth with water provided person is conscious. Call a physician.
Notes to Physician:  Treat symptomatically and supportively.

5. FIRE-FIGHTING MEASURES

Personal precautions:  As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing media:  In case of fire use dry chemical, carbon dioxide, or appropriate foam.
1. CHLOROETHYL CHLOROFORMATE

Unsuitable extinguishing media: Do NOT use water.

6. ACCIDENTAL RELEASE MEASURES

General Information: Use proper personal protective equipment as indicated in Section 8.
Personal precautions: Wear self-contained breathing apparatus, eye protection and gloves. Keep personal hygiene. Avoid contact with skin and eyes. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. Take precautionary measures against static discharges.
Environmental precautions: Do not let product enter the drains or rivers. Prevent further leakage or spillage if safe to do so.
Spills/Leaks: Soak up with inert absorbent material (e.g. sand, dry earth, vermiculite), then collect with an electrically protected vacuum cleaner or by wet-brushing and place into a suitable disposal container and dispose of as hazardous waste. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Ventilate area, clean up spills and wash spill site after material pickup is complete, observing precautions in the Protective Equipment section.

7. HANDLING AND STORAGE

Handling: Wear appropriate protective clothing - see Section 8. Wash thoroughly after handling. Use with adequate ventilation. Use only in a chemical fume hood. Avoid contact with skin, eyes and clothing. Avoid ingestion and inhalation. Avoid inhalation of vapour or mist. Avoid the formation or spread of mists in the air. Smoking is forbidden. Use non-sparking tools. Open and handle with care. Vent periodically.
Storage: Store in a cool, dry, well-ventilated area. Keep container tightly closed. Must only be kept in original packaging. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep away from sources of ignition. Prevent the build-up of electrostatic charge in the immediate area. Ensure lighting and electrical equipment are not a source of ignition. Vent
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

**Personal protection equipment:**

**Eye protection:** Wear appropriate protective eyeglasses with side-shields conforming to EN 166, chemical safety goggles or face-shield (min. 8-inch) as described by OSHA’s eye and face protection regulations. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

**Skin protection:** Wear appropriate protective gloves to prevent skin exposure, as defined in EU Directive 89/686/EEC and the standard EN 374 derived from it.

**Body protection:** Appropriate protective clothing, overalls.

**Respiratory protection:** Where risk assessment indicates air-purifying respirators are required use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Respirators and components must tested and approved under appropriate government standards - NIOSH (US) or CEN (EU).

**Hygiene measures:** Use good working practices. Wash hands and face thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** Clear colourless liquid.

**Odour:** Lachrymatory.

**Odour threshold:** Data not available/does not apply.

**pH:** Data not available/does not apply.

**Melting point:** -65 °C

**Boiling point:** 118 - 121 °C

**Flash point:** 40.5 °C

**Evaporation rate:** Data not available/does not apply.

**Flammability:** Data not available/does not apply.

**Flammability or explosive limits:** Data not available/does not apply.

**Vapor pressure:** 224.0 hPa at 20 °C

**Vapor density:** Data not available/does not apply.

**Relative density:** 1.325

**Density:** Data not available/does not apply.

**Solubility in water:** Reacts with water.
10. STABILITY AND REACTIVITY

Chemical stability: Stable under recommended storage conditions.
Conditions to avoid: Heat, hot surfaces, sources of ignition, flames, moist air, humidity.
Incompatibilities with other materials: Strong oxidizing agents, strong acids, water.
Hazardous decomposition products: In combustion emits toxic fumes of carbon monoxide/carbon dioxide, hydrogen chloride (HCl).
Hazardous polymerization: Data not available.

11. TOXICOLOGICAL INFORMATION

RTCS #: Data not available.
Acute toxicity: LD50: Oral: Rat: 470 mg/Kg
Skin corrosion/irritation: Data not available.
Serious eye damage/eye irritation: Data not available.
Respiratory or skin sensitization: Data not available.
Germ cell mutagenicity: Data not available.
Carcinogenicity: Data not available.
Reproductive toxicity: Data not available.
Specific target organ toxicity - single exposure: Data not available.
Specific target organ toxicity - repeated exposure: Data not available.
Aspiration hazard: Data not available.
Signs and symptoms of exposure:
Eye contact: There may be severe pain. The eyes may water profusely. There may be redness or whiteness of the skin in the area of exposure. Irritation or pain may occur at the side of contact. Absorption through the skin may be fatal.
Skin contact: There may be soreness and redness of the mouth and throat. There may be vomiting. Convulsions may occur.
Ingestion: Data not available.
Inhalation: There may be loss of consciousness. There may be shortness of breath with a burning sensation in the throat. Absorption through the lungs can occur causing symptoms similar to those of ingestion. Convulsions may occur. There may be loss of consciousness.

Delayed/immediate effects: Immediate effects can be expected after short-term exposure.

To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

Potential health effects:

Eye: Causes eye burns.

Skin: May be harmful by skin absorption. Causes skin burns.

Ingestion: Harmful if swallowed. Causes burns.

Inhalation: Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Chronic: No information found.

12. ECOLOGICAL INFORMATION
Data not available.

13. DISPOSAL CONSIDERATIONS
Observe all federal, state and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

14. TRANSPORT INFORMATION
This product is classified as hazardous for transport.

RID/ADR

Proper Shipping Name: CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (1-Chloroethyl chloroformate)
UN Number: 2742
Class: 6.1 (3,8)
Packing Group: II
Environmental hazard: No.
IMDG

Proper Shipping Name: CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (1-Chloroethyl chloroformate)
UN Number: 2742
Class: 6.1 (3.8)
Packing Group: II
Marine Pollutant: No.

IATA

Proper Shipping Name: CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S. (1-Chloroethyl chloroformate)
UN Number: 2742
Class: 6.1 (3.8)
Packing Group: II
Environmental hazard: No.

15. REGULATORY INFORMATION

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

16. ADDITIONAL INFORMATION

Further information on PPE:
European Standard & performance category markings:
EN14387 - Gas & vapour filter.
EN166- Standard for eye protection.
EN374 - Protects hands against chemicals and/or microorganisms.

Gas & vapour protection:  A Organic vapours
                          B Inorganic vapours
                          E Acid gases
                          K Ammonia and its derivatives

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.