

SAFETY DATA SHEET

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

- 1.1. Product identifier:
4-TERT-BUTYLCYCLOHEXYL CHLOROFORMATE
- Chemical name: 4-tert-Butylcyclohexyl chloroformate
CAS number: 42125-46-2
EC number: 255-670-9
Registration number: 01-2119472142-47-0002; 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
Tel.: +36 48 311-991
Fax: (48) 512-162
E-mail: info@framochem.hu
- 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

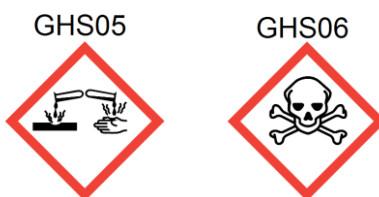
- 2.1. Classification of the substance:
Classification according to Regulation 1272/2008/EC (CLP):
Corrosive to metals, Hazard Category 1 – H290
Skin corrosion/irritation, Hazard Category 1B – H314
Acute toxicity (inhalation), Hazard Category 3 – H331
Hazardous to the aquatic environment – Chronic Hazard, Category 3 – H412

Warning H statements:

- H290** – May be corrosive to metals.
H314 – Causes severe skin burns and eye damage.
H331 – Toxic if inhaled.
H412 – Harmful to aquatic life with long lasting effects.

- 2.2. Label elements:

Chemical name: 4-tert-Butylcyclohexyl chloroformate
CAS number: 42125-46-2
EC number: 255-670-9



DANGER

FramoChem

A VanDeMark Company

Warning H statements:

- H290** – May be corrosive to metals.
H314 – Causes severe skin burns and eye damage.
H331 – Toxic if inhaled.
H412 – Harmful to aquatic life with long lasting effects.

Precautionary P statements:

- P273** – Avoid release to the environment.
P280 – Wear protective gloves/protective clothing/eye protection/face protection.
P284 – Wear respiratory protection.
P303 + P361 + P353 – IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
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/doctor.
P390 – Absorb spillage to prevent material damage.
P406 – Store in corrosive resistant container with a resistant inner liner.

2.3. Other hazards:

The substance does not meet the PBT or vPvB criteria according to Annex XIII of Regulation 1907/2006/EC.
Information concerning specific hazards for human and environment: see section 11-12.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance:

Chemical name: 4-tert-Butylcyclohexyl chloroformate
Synonym: Carbonochloridic acid, 4-(1,1-dimethylethyl)cyclohexyl ester
CAS number: 42125-46-2
EC number: 255-670-9
Formula: C₁₁H₁₉ClO₂
Molar mass: 219 g/mol
Purity: > 98 %

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.
- Do not induce vomiting.

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:

- 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 for 15 minutes holding eyelids apart (for at least 15 minutes).
- Obtain immediate medical attention 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:

No special treatment needed; treat symptomatically.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing media:

FramoChem

A VanDeMark Company

- 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 (phosgene, carbon dioxide, carbon monoxide, hydrochloric acid and vapour) may be formed, the inhalation of such combustion products can have serious adverse effects on health.
- 5.3. Advice 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, and 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 with skin, eyes and clothing, avoid inhalation.
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.
Use adequate personal protective equipment (see section 8).
Technical measures:
Ensure adequate ventilation / local extraction.
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.
Gradually decomposes in room temperature.
Keep away from moisture.
Store away from heat.
Storage temperature: ≤ 0 °C.
Incompatible materials: see section 10.5.
Packaging material: container with polyethylene liner.
- 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 2000/39/EC of 8 June 2000):
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		
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.
 Wash thoroughly after the work hours.

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 liquid		
2. Odour:	pungent		
3. Odour threshold:	no data available*		
4. pH value:	no data available*		
5. Melting point/freezing point:	-17 °C		
6. Initial boiling point/boiling range:	no data available*		
7. Flash point:	106 °C		
8. Evaporation rate:	no data available*		
9. Flammability (solid, gas):	no data available*		
10. Upper/lower flammability or explosive limits:	no data available*		
11. Vapour pressure:	30.62 x 10 ² Pa	20 °C	
	100 x 10 ² Pa	50 °C	
12. Vapour density:	no data available*		
13. Relative density:	no data available*		

14. Solubility(ies):	decomposes upon contact with water, soluble in common organic solvents	the substance is hydrolytically unstable at pH 4, 7 and 9 (half-life less than 12 hours)
15. Partition coefficient: n-octanol/water:	not applicable	
16. Auto-ignition temperature:	no data available*	
17. Decomposition temperature:	98 °C (ATD) E = 430 J/G	
18. Viscosity:	no data available*	
19. Explosive properties:	no data available*	
20. Oxidizing properties:	no data available*	
9.2. <u>Other information:</u>		
No data available.		
*: 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.		

SECTION 10: STABILITY AND REACTIVITY

- 10.1. Reactivity:
Not stable under normal conditions. Do not store above 0 °C.
- 10.2. Chemical stability:
Thermally non stable. Stable at room temperature.
In case of contact with water, decomposes.
- 10.3. Possibility of hazardous reactions:
Reacts violently with water.
- 10.4. Conditions to avoid:
Contact with water.
- 10.5. Incompatible materials:
Metals, bases, water, amines and alcohol.
- 10.6. Hazardous decomposition products:
Phosgene, carbon monoxide, carbon dioxide and hydrochloric acid vapour.

SECTION 11: TOXICOLOGICAL INFORMATION

- 11.1. Information on toxicological effects:
Acute toxicity: Toxic if inhaled.
Skin corrosion/irritation: Causes severe skin burns.
Serious eye damage/eye irritation: Causes serious eye damage.
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. 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 (oral, rat): 4600 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:
Ingestion: mucous membrane irritation and burning is likely.
Inhalation: the inhalation of the vapours may cause mucous membrane irritation. May cause burning in the respiratory tract. May cause pulmonary oedema.
Skin contact: Skin irritating.
Eye contact: Eye irritating.
Irritation: May cause respiratory irritation, causes skin and eye irritation.
Sensitization: No data concerning sensitization are available. Testing does not have to be conducted according to Column 2 Annex VII because the substance is corrosive.
- 11.1.5. Delayed and immediate effects as well as chronic effects from short and long-term exposure:

- Causes severe skin burns and eye damage.
Toxic 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:**
Harmful to aquatic life with long lasting effects.
- 12.2. **Persistence and degradability:**
In case of contact with water, decomposes.
- 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:**
ADR/RID; IMDG; IATA: UN 2747
- 14.2. **UN proper shipping name:**
ADR/RID: TERT-BUTYLCYCLOHEXYL CHLOROFORMATE
IMDG; IATA: TERT-BUTYLCYCLOHEXYL CHLOROFORMATE
- 14.3. **Transport hazard class(es):**
ADR/RID; IMDG; IATA: 6.1 T1
- 14.4. **Packaging group:**
ADR/RID; IMDG; IATA: III
- 14.5. **Environmental hazards:**
ADR/RID; IMDG; IATA: no
- 14.6. **Special precautions for user:**
Refrigerated transport!
- 14.7. **Transport in bulk according to Annex II of MARPOL 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) 2015/830 of 28 May 2015 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 (EU) 2015/830 (Section 1-16).

The classification of the substance has been changed compared to the previous version.

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, Very Bioaccumulative. n.d.: not defined. n.a.: not applicable. ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road. RID: Regulations Concerning the International Carriage of Dangerous Goods by Rail. IATA: International Air Transport Association. IMDG: International Maritime Dangerous Goods.

Key literature references and sources for data:

Previous version of the safety data sheet (31. 10. 2014, version CLP _ C),
REACH registration dossier.

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

H290 – May be corrosive to metals.

H314 – Causes severe skin burns and eye damage.

H331 – Toxic if inhaled.

H412 – Harmful to aquatic life with long lasting effects.

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.

Safety data sheet was prepared by: ToxInfo Kft.

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