

## SAFETY DATA SHEET

### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE 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 or mixture 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 út 5, Pf. 504

Tel: +36 (48) 311-991

Fax: +36 (48) 512-162

**1.3.1. Responsible person:**

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E-mail:

[info@framochem.hu](mailto:info@framochem.hu)

**1.4. Emergency telephone number:**

**Public Toxicological Health Service (ETTSZ)**

1097 Budapest, Albert Flórián út 2-6.

Tel.: +36 80 201 199 (0-24, free of charge – only from Hungary)

Tel.: +36 1 476 6464 (0-24, normal charge – also from foreign countries)

### SECTION 2: HAZARDS IDENTIFICATION

**2.1. Classification of the substance or mixture:**

Classification according to Regulation (EC) No 1272/2008 (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

**Hazard statements:**

**H290** – May be corrosive to metals.

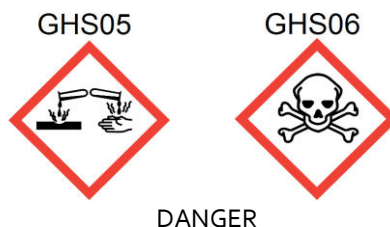
**H314** – Causes severe skin burns and eye damage.

**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



### **Hazard 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 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 or a doctor.  
**P390** – Absorb spillage to prevent material damage.  
**P406** – Store in corrosive resistant container with a resistant inner liner.

## 2.3. Other hazards:

No other known specific hazards for human or environment.  
Information concerning specific hazards for human and environment: see Sections 11 and 12.  
The substance does not meet the PBT or vPvB criteria according to Annex XIII of Regulation 1907/2006/EC.  
Endocrine disrupting property: Not an endocrine disruptor.

## 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: C<sub>11</sub>H<sub>19</sub>ClO<sub>2</sub>  
Molar mass: 219 g/mol  
Purity: >98 %

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures:

#### 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.

**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.
- First aiders should take care of their own safety.

**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.

**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:**

Causes severe skin burns and eye damage.

Toxic if inhaled.

**4.3. Indication of any immediate medical attention and special treatment needed:**

No special treatment needed; treat symptomatically.

## SECTION 5: FIREFIGHTING 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 (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 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:**

Allow only well-trained experts wearing suitable protective clothing to abide in the field of the 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 the spillage and the resulting waste according to the applicable environmental regulations. Do not allow the product 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 Sections 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.

Keep away from moisture.

Store away from heat.

**Storage temperature:**  $\leq 0$  °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 (EC) No 2000/39 of 8 June 2000):

The substance is not regulated with exposure limit value.

DNEL values		Oral exposure		Dermal exposure		Inhalative exposure	
		Short term (acute)	Long term (chronic)	Short term (acute)	Long term (chronic)	Short term (acute)	Long term (chronic)
Consumer	Local	no data	no data	no data	no data	no data	no data
	Systemic	no data	no data	no data	no data	no data	no data
Worker	Local	no data	no data	no data	no data	no data	no data
	Systemic	no data	no data	no data	no data	no data	no data

PNEC values		
Compartment	Value	Note(s)
Freshwater	10 µg/L	no notes
Marine water	1 µg/L	no notes
Freshwater sediment	115 µg/kg sediment dry weight	no notes
Marine water sediment	no data	no notes
Sewage Treatment Plant (STP)	4 mg/L	no notes
Intermittent release	100 µg/L	no notes
Secondary poisoning	no data	no notes
Soil	34.6 µg/kg soil dry weight	no notes

### 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 (EN ISO 16321-1:2022; EN 166).

2. **Skin protection:**

a. **Hand protection:** Use appropriate protective gloves (EN 374).

Suitable materials for prolonged direct contact (recommended: protection index 6)

> 480 minutes penetration time,

nitrile rubber (NBR) - 0.4 mm layer thickness,

fluoroelastomer (FKM) - 0,7 mm layer thickness.

Due to the wide variety of types, the manufacturer's instructions for use must be followed.

Specifications are based on tests, literature data and information from glove manufacturers or derived by analogy from similar materials. Due to a number of circumstances (e.g. temperature), it should be taken into account that in practice the practical use of chemical protective gloves may be much shorter than the penetration time specified by the testing.

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 hazards:** No thermal hazards known.

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 is necessary before deciding upon further protective measures.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. **Information on basic physical and chemical properties:**

Parameter	Value / Test method / Remarks
1. Physical state	liquid
2. Colour	colourless
3. Odour, odour threshold	pungent
4. Melting point/freezing point	-20 - -10 °C
5. Boiling point or initial boiling point and boiling range	no data*
6. Flammability	no data*
7. Lower and upper explosion limit	no data*
8. Flash point	-209.15 °C (101 325 Pa)
9. Auto-ignition temperature	380 °C (101 325 Pa)
10. Decomposition temperature	98 °C (ATD) E = 430 J/G
11. pH	no data*
12. Kinematic viscosity	no data*
13. Solubility in water in other solvents	decomposes upon contact with water; soluble in common organic solvents remark: the substance is hydrolytically unstable at pH 4, 7 and 9 (half-life less than 12 hours)
14. Partition coefficient n-octanol/water (log value)	not applicable
15. Vapour pressure	2 hPa (20 °C)
16. Density and/or relative density	density: 1.04 g/cm <sup>3</sup> (20 °C) relative density: 1.04 (20 °C)
17. Relative vapour density	no data*
18. Particle characteristics	no data*

**9.2. Other information:**

**9.2.1. Information with regard to physical hazard classes:**

Explosive properties: Non-explosive.

Oxidizing properties: Non-oxidizing.

**9.2.2. Other safety characteristics:**

No other characteristics 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, or the property is not applicable for the product.

## 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. Decomposes upon contact 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 hazard classes as defined in Regulation (EC) No 1272/2008:**

**Acute toxicity:** Toxic if inhaled.

**Skin corrosion/irritation:** Causes severe skin burns and eye damage.

**Serious eye damage/irritation:** Based on available data, the classification criteria are not met.

**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. Summaries of the information derived from the test conducted:**

No data available.

**11.1.2. Relevant toxicological properties:**

Acute toxicity:

LD50 (oral, rat): 2000 mg/kg bw

Irritation/corrosion:

Skin: Observed adverse effect (corrosive effect).

Eyes: Observed adverse effect (severe irritant effect).

**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.

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.
- 11.2. Information on other hazards:**  
**Endocrine disrupting properties:**  
Endocrine disrupting property: Not an endocrine disruptor.  
**Other information:**  
No data available.

## SECTION 12: ECOLOGICAL INFORMATION

- 12.1. Toxicity:**  
Harmful to aquatic life with long lasting effects.  
Dissipation half life (DT<sub>50</sub>):  
19.08 – 26.6 h  
LC<sub>50</sub> (fish): 4.92-10 mg/l/4 days  
LC<sub>100</sub> (fish): 21.5 mg/l/4 days  
NOEC (fish): 4.6 mg/l/4 days  
EC<sub>50</sub> (aquatic invertebrates): 492 - 30900 µg/l/48h  
EC<sub>50</sub> (aquatic invertebrates): 492 µg/l/24h  
EC<sub>0</sub> (aquatic invertebrates): 30.9 mg/l/48h  
EC<sub>100</sub> (aquatic invertebrates): 30.9 mg/l/48h  
EC<sub>50</sub> (algae and cyanobacteria): 492 - 45000 µg/l/72h  
NOEC (algae and cyanobacteria): 97 - 14000 µg/l/72h  
EC<sub>10</sub> (algae and cyanobacteria): 15 - 21 mg/l/72h  
EC<sub>50</sub> (microorganisms): 400 mg/l/3h
- 12.2. Persistence and degradability:**  
Decomposes upon contact with water.  
Readily biodegradable.
- 12.3. Bioaccumulative potential:**  
No data available.
- 12.4. Mobility in soil:**  
Henry's law constant: 1.54 - 1350 Pa m<sup>3</sup>/mol (25 °C; 101.3 kPa)
- 12.5. Results of PBT and vPvB assessment:**  
The substance does not meet the criteria for PBT or vPvB substances.
- 12.6. Endocrine disrupting properties:**  
Endocrine disrupting property: Not an endocrine disruptor.
- 12.7. 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.  
**List of Waste Code:**  
No waste disposal key according to the List of Waste Code (LoW code) can be determined for this product, as only the purpose of application defined by the user enables an allocation. The LoW code number has to be determined after a discussion with a waste disposal specialist.
- 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:**  
No data available.
- 13.1.4. Sewage disposal:**  
No data available.
- 13.1.5. Special precautions for any recommended waste treatment:**  
No data available.

## SECTION 14: TRANSPORT INFORMATION

- 14.1. UN number or ID 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 Classification code: T1
- 14.4. Packing 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. Maritime transport in bulk according to IMO instruments:**  
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 (EC) No 1999/45 and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive (EEC) No 76/769 and Commission Directives (EEC) No 91/155, (EEC) No 93/67, (EC) No 93/105 and (EC) No 2000/21

**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 (EEC) No 67/548 and (EC) No 1999/45, and amending Regulation (EC) No 1907/2006

**COMMISSION REGULATION (EU) 2020/878** of 18 June 2020 amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

- 15.2. Chemical safety assessment:** No information.

## SECTION 16: OTHER INFORMATION

**Information regarding the revision of the safety data sheet:**

The safety data sheet has been revised according to Regulation (EU) 2020/878 (Section 1-16).  
The hazard classification of the substance did not change compared to the previous version.

This safety data sheet supersedes all previous versions according to Annex II of Regulation (EC) No 1907/2006.

**Literature references / data sources:**

Previous version of the safety data sheet (11. 12. 2018, version CLP\_D).

**Relevant hazard statements (code and full text) of Sections 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.



**Full text of the abbreviations in the safety data sheet:**

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.  
ADR: Agreement concerning the International Carriage of Dangerous Goods by Road.  
ATE: Acute Toxicity Estimate.  
AOX: Adsorbable organic halides.  
BCF: Bioconcentration factor.  
BOD: Biological Oxygen Demand.  
CAS number: Chemical Abstract Service number.  
CLP: Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures.  
CMR effects: Carcinogenic, mutagenic, reprotoxic effects.  
COD: Chemical Oxygen Demand.  
CSA: Chemical Safety Assessment.  
CSR: Chemical Safety Report.  
DNEL: Derived-No-Effect-Level.  
ECHA: European Chemical Agency.  
EC: European Community.  
EC number: EINECS and ELINCS numbers (see also EINECS and ELINCS).  
EEC: European Economic Community.  
EEA: European Economic Area (EU + Iceland, Liechtenstein and Norway).  
EINECS: European Inventory of Existing Commercial Chemical Substances.  
ELINCS: European List of Notified Chemical Substances.  
EN: European Norm.  
EU: European Union.  
EWC: European Waste Catalogue (replaced by LoW – see below).  
GHS: Globally Harmonized System of Classification and Labelling of Chemicals.  
IATA: International Air Transport Association.  
ICAO-TI: Technical Instructions for the Safe Transport of Dangerous Goods by Air.  
IMDG: International Maritime Dangerous Goods.  
IMO: International Maritime Organization.  
IMSBC: International Maritime Solid Bulk Cargoes.  
IUCLID: International Uniform Chemical Information Database.  
IUPAC: International Union of Pure and Applied Chemistry.  
Kow: n-Octanol - Water Partition Coefficient.  
LC50: Lethal concentration resulting in 50 % mortality.  
LD50: Lethal dose resulting in 50 % mortality (median lethal dose).  
LoW: List of Waste.  
LOEC: Lowest Observed Effect Concentration.  
LOEL: Lowest Observed Effect Level.  
NOEC: No Observed Effect Concentration.  
NOEL: No Observed Effect Level.  
NOAEC: No Observed Adverse Effect Concentration.  
NOAEL: No Observed Adverse Effect Level.  
OECD: Organization for Economic Cooperation and Development.  
OSHA: Occupational Safety and Health Administration.  
PBT: Persistent, Bioaccumulative and Toxic.  
PNEC: Predicted No Effect Concentration.  
QSAR: Quantitative Structure Activity Relationship.  
REACH: Regulation 1907/2006/EC concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals.  
RID: Regulations Concerning the International Transport of Dangerous Goods by Rail.  
SCBA: Self Contained Breathing Apparatus.  
SDS: Safety Data Sheet.  
STOT: Specific Target Organ Toxicity.  
SVHC: Substances of Very High Concern.  
UN: United Nations.  
UVCB: Chemical Substances of Unknown or Variable Composition, Complex Reaction Products and Biological Materials.  
VOC: Volatile Organic Compound.  
vPvB: very Persistent and very Bioaccumulative.

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.

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Safety data sheet was prepared by:  
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International branch of ToxInfo Kft.

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