

# FramoChem

A VanDeMark Company  
**SAFETY DATA SHEET**

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

- 1.1. Product identifier:  
**DIETHYL CARBONATE**
- IUPAC name: Diethyl carbonate  
CAS number: 105-58-8  
EC number: 203-311-1  
Registration number: 01-2119943044-45-0001; complete registration.
- 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:  
**Manufacturer and distributor:**  
**FRAMOCHEM FRENCH-HUNGARIAN FINE CHEMICALS LTD.**  
3700 Kazincbarcika, Szervíz str. 5., PO Box 504  
Telephone: +36 (48) 311-991  
Fax: +36 (48) 512-162  
E-mail: [info@framochem.hu](mailto:info@framochem.hu)
- 1.3.1. Name of the responsible person: -  
E-mail: [info@framochem.hu](mailto:info@framochem.hu)
- 1.4. Emergency telephone number: +36 1 476 6464, +36 80 201 199 (0-24 h)

## SECTION 2: HAZARDS IDENTIFICATION

- 2.1. Classification of the substance:
- Classification according to Regulation 1272/2008/EC (CLP):  
Flammable liquids, Hazard Category 3 – H226
- Warning **H statements:**  
**H226** – Flammable liquid and vapour.
- 2.2. Label elements:
- IUPAC name: Diethyl carbonate  
CAS number: 105-58-8  
EC number: 203-311-1



Warning **H statements:**  
**H226** – Flammable liquid and vapour.

Precautionary **P statements:**  
**P210** – Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
**P240** – Ground/bond container and receiving equipment.  
**P243** – Take precautionary measures against static discharge.

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**P303 + P361 + P353** – IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

**P403 + P235** – Store in a well-ventilated place. Keep cool.

**P501** – Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3. Other hazards:

The substance is not PBT / vPvB.

Information concerning specific hazards for human and environment: See Section 11.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance:

IUPAC name: Diethyl carbonate

Synonym: Carbonic acid, diethyl ester

CAS number: 105-58-8

EC number: 203-311-1

Formula: C<sub>5</sub>H<sub>10</sub>O<sub>3</sub>

Molar mass: 118.13 g/mol

Purity: > 99.9%

## SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures:

General information: If symptoms persist or in case of doubt, seek medical advice.

IN CASE OF INGESTION:

Measures:

- Rinse out mouth and then drink plenty of water.
- Whether vomiting should be induced or not has to be decided by a doctor.
- Seek medical treatment.

IN CASE OF INHALATION:

Measures:

- Supply fresh air; consult doctor in case of pain.

IN CASE OF SKIN CONTACT:

Measures:

- Remove soiled clothes and shoes.
- Clean effected skin thoroughly with water and a mild cleansing agent.
- No residues shall remain on the skin.

IN CASE OF EYE CONTACT:

Measures:

- Rinse opened eye for several minutes under running water.
- If symptoms persist, consult a doctor.

4.2. Most important symptoms and effects, both acute and delayed:

After resorption of larger quantities, the following symptoms may occur:

Drowsiness, dizziness, spasms, euphoria, narcotic effect.

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:

5.1.1. Suitable extinguishing media:

Foam, fire-extinguishing powder, carbon dioxide.

Use fire fighting measures that suit the environment.

5.1.2. Unsuitable extinguishing media:

Direct jet water.

5.2. Special hazards arising from the substance or mixture:

Flammable liquid and vapour.

In case of fire, smoke and other combustion products may be formed, the inhalation of such combustion products can have serious adverse effects on health.

Heating leads to pressure increase entailing danger of bursting and explosion.

5.3. Advise for fire fighters:

Wear full protective clothing and self-contained breathing apparatus.

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Immediately cool neighbouring packages and containers with sprayed water and, if possible, remove them out of the danger zone.

Dispose of fire debris and contaminated fire-fighting water in accordance with official regulations.

## 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:  
Wear protective equipment.  
Keep unprotected persons away.  
Ensure adequate ventilation.  
Use respiratory protective device against the effects of fumes/dust/aerosol.  
Do not smoke - keep ignition sources away.
- 6.2. Environmental precautions:  
Do not allow product to reach sewage system or any water course.  
Prevent seepage into sewage system, workpits and cellars.
- 6.3. Methods and material for containment and cleaning up:  
Absorb with non-combustible material like sand, soil or diatomite.  
Ensure adequate ventilation.  
Make sure to recycle or dispose of in suitable receptacles.  
Dispose contaminated materials as waste according to section 13.
- 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 eyes and skin.  
Avoid inhalation of vapours.  
Technical measures:  
Ensure good ventilation/exhaustion at the workplace.  
Ensure good interior ventilation, especially at floor level (fumes are heavier than air).  
Precautions against fire and explosion:  
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
Ground/bond container and receiving equipment.  
Take precautionary measures against static discharge.  
Fumes can combine with air to form an explosive mixture.  
No welding.  
Work on containers and pipelines is permitted only after thorough purging and inerting.
- 7.2. Conditions for safe storage, including any incompatibilities:  
Technical measures and storage condition:  
Keep in original, closed and labelled container.  
The place of storage has to be properly ventilated and cleanable.  
Store in cool and dry place.  
Keep away the unauthorized persons.  
Avoid spillage of the product.  
Keep away from incompatible materials (eg.: strong oxidants).  
Keep away from heat and ignition sources.  
Keep away from humidity, water and the moisture of the air.  
Do not smoke in the place and the vicinity of the storage!  
Follow all instructions on the label.  
Incompatible materials: strong oxidizing agents.  
Packaging material: Metal container lined with polyethylene or with inert material, polyethylene container, stainless steel container. It is forbidden to use other packaging material or packaging material made of other material.
- 7.3. Specific end use(s):  
No specific instructions available.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

- 8.1. Control parameters:

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Occupational exposure limit values:

The substance is not regulated with exposure limit value.

**DNEL values:**

Workers:

Long-term exposure, systemic effects (inhalation): 7.4 mg/m<sup>3</sup>

Long-term exposure, systemic effects (dermal): 7 mg/kg bw/day

**PNEC values:**

Freshwater: 0.1 mg/l

Intermittent release: 1 mg/l

Marine water: 0.01 mg/l

STP: 100 mg/l

Freshwater sediment: no exposure of sediment expected

Marine water sediment: no exposure of sediment expected

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.

8.2.2. **Individual protection measures, such as personal protective equipment:**

The usual precautionary measures should be adhered to when handling chemicals.

Remove all soiled and contaminated clothing immediately.

Keep away from foodstuffs, beverages and feed.

Do not eat, drink, smoke or sniff while working.

Do not inhale gases / fumes / aerosols.

Avoid contact with the eyes and skin.

Wash hands before breaks and at the end of work.

After skin contact cleanse skin thoroughly.

After contact with eyes rinse immediately.

1. Eye/face protection: appropriate goggles are recommended during refilling (EN 166).

2. Skin protection:

a. Hand protection: use chemically resistant protective gloves (EN 374).

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

To avoid skin problems, reduce the wearing of gloves to the required minimum.

After use of gloves apply skin-cleaning agents and skin cosmetics.

Material of gloves: butyl rubber (BR).

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Penetration time of glove material:

Butyl 0.5 mm ≥ 240 minutes (in case of permanent contact do not use gloves more than 4 hours).

The exact penetration time has to be found out by the manufacturer of the protective gloves and has to be observed.

Not suitable glove materials: natural rubber (NR), polychloropren rubber (CR), nitrile rubber (NBR), fluorocarbon rubber (FKM), polyvinylchloride (PVC).

b. Other: use flame retardant, antistatic protective clothing.

3. Respiratory protection: Not necessary if room is well-ventilated. Use suitable respiratory protective device in case of insufficient ventilation.

In case of unintended release:

In case of brief exposure or low pollution use a respiratory filter device. In case of intensive or longer exposure use a respiratory protective device that is independent of circulating air.

Short term filter device: filter A.

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.**

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## 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	20 °C, 1013 hPa	
2. <b>Odour:</b>	mild odour		
3. Odour threshold:	no data available*		
4. pH value:	no data available*		
5. Melting point/ freezing point:	- 43 °C	101 325 Pa	
6. Initial boiling point/boiling range:	126 °C	101 325 Pa	
7. Flash point:	25 °C	101 325 Pa, closed cup	
8. Evaporation rate:	no data available*		
9. Flammability (solid, gas):	flammable liquid and vapour		
10. Upper/lower flammability or explosive limits:	no data available*		
11. Vapour pressure:	10.8 mm Hg (=14.4 hPa)	25 °C	
12 Vapour density:	no data available*		
13. Relative density:	no data available*		
14. Solubility(ies):	soluble in water up to 18.8 g/l	20 °C	
15. Partition coefficient: n-octanol/water:	1.21 (log Pow)	QSAR, 25 °C	
16. Auto-ignition temperature:	445 °C	101 325 Pa	
17. Decomposition temperature:	no data available*		
18. Viscosity:	0.837 +/- 0.007 mPa*s	20 °C	dynamic
19. Explosive properties:	non-explosive		
20. Oxidizing properties:	non-oxidizing		

### 9.2. Other information:

Density: 0.9692 g/cm<sup>3</sup> (20 °C), 0.9752 g/cm<sup>3</sup> (30 °C)

Diethyl carbonate is a reactive intermedier for organic synthesis, pharmaceutical synthesis. Solvent of resins, oils, cellulose esters and nitrocellulose.

The product hydrolyses very slowly, while carbon dioxide and ethanol are formed.

The vapours of the diethyl carbonate and ethanol can form explosive mixtures with air.

\*: 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:

At normal temperature and general conditions of work stabile.

### 10.2. Chemical stability:

At normal temperature and general conditions of work stabile.

### 10.3. Possibility of hazardous reactions:

Strong exothermic reaction with strong oxidizing agents.

### 10.4. Conditions to avoid:

To avoid thermal decomposition do not overheat.

### 10.5. Incompatible materials:

Strong oxidizing agents.

### 10.6. Hazardous decomposition products:

No decomposition if used and stored according to specifications.

In case of fire or at high temperatures the formation of following decomposition products may be formed:

Carbon monoxide, carbon dioxide, irritant gases/vapours.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information on toxicological effects:

Acute toxicity: Based on available data, the classification criteria are not met.

Skin corrosion/irritation: Based on available data, the classification criteria are not met.

Serious eye damage/eye 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.

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**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, male): > 5 ml/kg bw (> 4876 mg/kg bw)

LC50 (inhalation, rat, male/female): 19.5 mg/l air/7h

**Irritation/corrosion:**

- Skin: not irritating (rabbit).

- Eye: not irritating (rabbit).

**Sensitization:**

Not sensitizing (mouse, female).

**Repeated dose toxicity:**

- Oral:

Species: mouse, male/female

Duration of exposure: 83 weeks

LOAEL (mouse, male): 50 ppm

LOAEL (mouse): 7 mg/kg bw/day

- Inhalation:

Species: mouse, rat, rabbit

NOAEC: > 18995 mg/l air (analytical)

LC50 (rat): > 1.83 mg/l/7h (1 day)

LC50 (rat): > 1.593 mg/l/7h (5 days)

LC50 (rat): > 1.268 mg/l/7h (1 day)

LC50 (rat): > 1.593 mg/l/7h (5 days)

- Dermal:

Species: mouse

NOAEL: 48300 mg/kg bw/day (nominal)

**Genetic toxicity:**

- in vitro:

Guideline: OECD 487

Test type: in vitro mammalian cell micronucleus test

Species: human peripheral blood lymphocytes

Metabolic activation: with and without (S9)

Genotoxicity: positive (adverse effect observed)

Cytotoxicity: no

- in vivo:

Guideline: OECD 474

Test type: micronucleus assay

Species: mouse (male)

Route of administration: intravenous

Genotoxicity: negative (no adverse effect observed)

**Carcinogenicity:**

Method: long-term oral toxicity

Species: mouse (male/female)

Frequency of treatment: 83 weeks

LOAEL: 7 mg/kg bw/day (adverse effect observed)

Target organ: urogenital (testes)

**Reproductive toxicity:**

- Effects on fertility:

NOAEL: 214.3 mg/kg bw/day (no adverse effect observed)

NOAEC: 18995 mg/m<sup>3</sup> (no adverse effect observed)

- Effects on development:

NOAEL: ≥ 214.3 mg/kg bw/day (nominal) (no effects)

LOAEL: 35.7 mg/kg bw/day (nominal) (adverse effect observed)

11.1.3. Information on likely routes of exposure:

Ingestion, inhalation, skin contact, eye contact.

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- 11.1.4. Symptoms related to the physical, chemical and toxicological characteristics:  
After resorption of larger quantities, the following symptoms may occur:  
Drowsiness, dizziness, spasms, euphoria, narcotic effect.
- 11.1.5. Delayed and immediate effects as well as chronic effects from short and long-term exposure:  
No data available.
- 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:  
Hazard for air: no hazard identified.  
Hazard for terrestrial organisms: no exposure of soil expected.  
Hazard for predators: no potential for bioaccumulation.  
LC0 (fish):  $\geq 65$  mg/l  
LC50 (freshwater fish): 100 mg/l  
NOEC (daphnia):  $\geq 100$  mg/l  
EC50/LC50 (freshwater invertebrates): 100 mg/l  
NOEC (algae):  $\geq 100$  mg/l  
EC10/LC10/NOEC (freshwater algae): 100 mg/l  
EC50 (microorganisms):  $\geq 10000$  mg/l  
EC50/LC50 (microorganisms): 10000 mg/l
- 12.2. Persistence and degradability:  
**Phototransformation in air:**  
Diethyl carbonate is expected to exist solely as a vapor in the ambient atmosphere (10.8 mm Hg vapour pressure at 25 °C). Vapor-phase diethyl carbonate is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals: the half-life for this reaction in air is estimated to be 5 days.  
Diethyl carbonate may also undergo direct photolysis in the environment since this compound contains a functional group that can absorb light greater than 290 nm.  
**Hydrolysis:**  
Diethyl carbonate is not expected to adsorb to suspended solids and sediment in water.  
Volatilization from water surfaces is expected to be an important fate process.  
Diethyl carbonate may undergo hydrolysis in water since esters are susceptible to hydrolysis.  
**Biodegradation in water:**  
In the test period of 27 days diethyl carbonate pure was degraded to 75%.  
The test substance was not found to be toxic to bacteria at the test concentration.  
The substance is readily biodegradable.  
**Biodegradation in soil:**  
Diethyl carbonate carbonate is expected to have high mobility in soil.  
Volatilization of diethyl carbonate from moist soil surfaces is expected to be an important fate process.  
Diethyl carbonate may volatilize from dry soil surfaces based upon its vapor pressure (10.8 mm Hg).
- 12.3. Bioaccumulation potential:  
No potential for bioaccumulation.
- 12.4. Mobility in soil:  
Diethyl carbonate is expected to have high mobility in soil.
- 12.5. Results of PBT and vPvB assessment:  
The substance is not PBT / 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:  
Must not be disposed of together with household garbage.  
Do not allow product to reach sewage system.  
Disposal according to instructions of local authorities.

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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:  
Recommendation: disposal must be made according to official regulations.
- 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 2366
- 14.2. UN proper shipping name:  
**ADR/RID:**  
DIETHYL CARBONATE  
**IMDG:**  
DIETHYL CARBONATE  
**IATA:**  
Diethyl carbonate
- 14.3. Transport hazard class(es):  
**ADR/RID:**  
Class: 3 (F1)  
Label: 3  
**IMDG:**  
Class: 3  
Label: 3  
**IATA:**  
Class: 3  
Label: 3
- 14.4. Packaging group:  
**ADR/RID; IMDG; IATA:**  
III
- 14.5. Environmental hazard:  
**ADR/RID; IMDG; IATA:**  
No
- 14.6. Special precautions for user:  
**IMDG:**  
EmS: F-E,S-D
- 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.



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## 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).

There is change in the hazard classification 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. ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterway. RID: European Agreements Concerning the International Carriage of Dangerous Goods by Rail. IMDG: International Maritime Dangerous Goods Code. IATA: International Air Transport Association.

Key literature references and sources for data:

previous version of the safety data sheet (30. 11. 2016, version CLP\_D),  
REACH registration dossier.

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

**H226** – Flammable liquid and vapour.

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:  
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