

SAFETY DATA SHEET

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

1.1. Product identifier:

N-PROPYL CHLOROFORMATE

IUPAC name: n-Propyl chloroformate

CAS number: 109-61-5

EC number: 203-687-7

Registration number: 01-2119457016-43-0002; Transported isolated intermediate.

1.2. Relevant identified uses of the substance or mixture and uses advised against:

Organic synthesis intermediate for industrial use.

Environmental release category:

ERC1: Manufacture of the substance

ERC6a: Use of intermediate

Process category:

PROC 1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

PROC 2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC 3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment conditions

PROC 8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities

PROC 9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

PROC 15: Use as laboratory reagent

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

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):

Flammable liquids, Hazard Category 2 – H225

Acute toxicity (oral), Hazard Category 4 – H302

Skin corrosion/irritation, Hazard Category 1B – H314

Serious eye damage/eye irritation, Hazard Category 1 – H318

Acute toxicity (inhalation), Hazard Category 2 – H330

Hazard statements:

H225 – Highly flammable liquid and vapour.

H302 – Harmful if swallowed.

H314 – Causes severe skin burns and eye damage.

H318 – Causes serious eye damage.

H330 – Fatal if inhaled.

2.2. Label elements:

IUPAC name: n-Propyl chloroformate

CAS number: 109-61-5

EC number: 203-687-7



Hazard statements:

H225 – Highly flammable liquid and vapour.

H302 – Harmful if swallowed.

H314 – Causes severe skin burns and eye damage.

H330 – Fatal if inhaled.

Precautionary statements:

P210 – Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P223 – Do not allow contact with water.

P240 – Ground and bond container and receiving equipment.

P241 – Use explosion-proof electrical/ventilating/lighting equipment.

P242 – Use non-sparking tools.

P243 – Take action to prevent static discharges.

P280 – Wear protective gloves/protective clothing/eye protection/face protection.

P260 – Do not breathe dust/fume/gas/mist/vapours/spray.

P271 – Use only outdoors or in a well-ventilated area.

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

P370 + P378 – In case of fire: Use powder, carbon dioxide, foam to extinguish.

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:

No other known specific hazards for human or environment.

Information concerning specific hazards for human and environment: see Section 11 and 12.

The substance does not meet the criteria for PBT or vPvB substances 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:

IUPAC name: n-Propyl chloroformate
Synonym: Chlorformate n-propyl ester
CAS number: 109-61-5
EC number: 203-687-7
Index number: 607-142-00-8
Formula: C₄H₇ClO₂
Molar mass: 122.5 g/mol
Purity: ≥ 99 %

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures:

General information: Obtain immediate medical attention and show him the label. First aid personnel should pay attention to their own safety.

INGESTION:

Measures:

- Obtain immediate medical attention and show him the label or this safety data sheet.
- 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.
- Flush the mouth of the victim with plenty of water then give him 1-2 glasses of water.

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.
- Apply oxygen if necessary.
- Obtain medical attention and show him the label or this safety data sheet.

SKIN CONTACT:

Measures:

- Remove the contaminated clothes.
- Wash the skin surface with plenty of water and soap (for 15 minutes).
- The substance penetrates through the skin and may cause poisoning. For the first-aiders it is recommended to wear protective equipment (protective gloves).
- If symptoms occur, obtain immediate medical attention and show him the label.

EYE CONTACT:

Measures:

- In case of contact with eyes flush with water while moving the eyeballs and 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:

Harmful if swallowed.

Causes severe skin burns and eye damage.

Fatal if inhaled.

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

No special treatment needed; treat symptomatically.

Medical monitoring for at least 24 hours.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media:

5.1.1. Suitable extinguishing media:

Powder, carbon dioxide, foam.

5.1.2. Unsuitable extinguishing media:

Avoid the use and contact with water.

Do not use full water jet, because it can disperse and spread fire.

5.2. Special hazards arising from the substance or mixture:

Highly flammable liquid and vapour.

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

5.3. Advice for firefighters:

Wear full protective clothing and self-contained breathing apparatus.

These means can protect from the skin and eye contact and from the inhalation of the hazardous gases and smoke.

Fire debris must be disposed of 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:

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 from the place of the accident.

Remove all ignition sources from the affected area.

Close the designated area.

Ensure adequate ventilation.

Breathing protection required.

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 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.

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 (showering) is required.

Protect against moisture.

Protect against heat.

Technical measures:

Effective ventilation is required during the handling of the product.

Precautions against fire and explosion:

Keep away from heat, sparks, open flame and hot surfaces. No smoking.

Prevent electrostatic charge.

Fire extinguishers should be kept handy.

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 direct sunshine and other heat- and explosion sources.

Storage duration: 6 Months.

Protect from temperatures above 35 °C.

Storage temperature: 20 °C

Incompatible materials: See Section 10.5

Packaging material: glass, Steel with polyethylene liner, stainless steel with PTFE-coating, Isoemail PM Noir, special steel Hastelloy B3 2.4600, Proco-Enamel Unsuitable materials for containers: carbon steel (iron), Stainless steel 1.4571, Stainless steel 1.4306 (V2A).

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:

Freshwater: 1 mg/l

Intermittent release: 20 mg/l

Marine water: 0.1 mg/l

Freshwater sediment: 0.1 mg/kg

STP: 10 mg/l

Soil: 0.218 mg/kg soil dw

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.

The inhalation exposure should be avoided.

Ensure adequate ventilation, especially in closed areas.

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

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

Do not eat or smoke during the processing.

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

Do not breathe vapour/spray.

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

1. **Eye/face protection:** Use appropriate tightly fitting 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 short-term contact and/or splashes (recommended: At least protective index 2, > 30 minutes): butyl rubber (butyl) - 0.7 mm. Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

b. **Other:** Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

3. **Respiratory protection:** Use breathing protection if gases/vapours are formed. Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A) Suitable respiratory protection for higher concentrations or long-term effect: Self-contained breathing apparatus.

4. **Thermal hazards:** No thermal hazards 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 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	< -70 °C
5. Boiling point or initial boiling point and boiling range	112.4 °C (101 325 Pa)
6. Flammability	highly flammable liquid and vapour
7. Lower and upper explosion limit	no data*
8. Flash point	16 °C (101 325 Pa)
9. Auto-ignition temperature	475 °C (101 325 Pa)
10. Decomposition temperature	no data*
11. pH	not applicable
12. Kinematic viscosity	no data*
13. Solubility in water in other solvents	decomposes upon contact with water; water solubility: 10890 mg/L soluble in common organic solvents
14. Partition coefficient n-octanol/water (log value)	not applicable
15. Vapour pressure	26.7 hPa (25.3 °C)
16. Density and/or relative density	1.09 g/cm ³ (20 °C) relative density: 1.091 (20 °C)
17. Relative vapour density	4.2 (air = 1)
18. Particle characteristics	no data*

9.2. Other information:

9.2.1. Information with regard to physical hazard classes:

Explosive properties: Non-explosive.

Oxidising properties: Non-oxidising.

9.2.2. Other safety characteristics:

Dynamic viscosity: 0.8 mPa.s (20 °C)

*: 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:

Stable at room temperature and general conditions of work.

10.2. Chemical stability:

Stable at normal temperature and general conditions of work.

10.3. Possibility of hazardous reactions:

In case of contact with humid air or water, hydrolyzes.

The formation of gaseous decomposition products builds up pressure in tightly closed containers if the product is greatly overheated. Evolution of corrosive gases/vapours. Reacts with water and basic components to generate heat. Reacts with activated carbon. Reacts with alkalis and metals. Reacts with alcohols, amines, aqueous acids and alkalis. Reacts with water and moisture, with formation of hydrogen chloride. Partly very violent reactions with bases and numerous organic classes of substances such as alcohols and amines. Impurities promote decomposition. Energy is released when reacting with e.g. acids, alkaline reacting substances, amines or catalysts. Traces of heavy metals reduce the onset temperature and lead to instability and exothermic product release with gas formation. Vapours may form ignitable mixture with air.

See Section 10.5.

10.4. Conditions to avoid:

Temperature: 40 °C

Avoid all sources of ignition: heat, sparks, open flame. Avoid direct sunlight. Avoid electro-static charge. Avoid humidity. Avoid heat. Avoid prolonged storage. Disregard of the conditions mentioned may result in undesirable decomposition reactions. Avoid excessive temperatures. Avoid contamination.

- 10.5. **Incompatible materials:**
Alkaline reactive substances, alcohols, bases, amines, iron compounds, heavy metal salts, water.
- 10.6. **Hazardous decomposition products:**
Chloromethane; methyl chloride, hydrogen chloride, carbon dioxide.

SECTION 11: TOXICOLOGICAL INFORMATION

- 11.1. **Information on hazard classes as defined in Regulation (EC) No 1272/2008:**
Acute toxicity: Harmful if swallowed. Fatal if inhaled.
Skin corrosion/irritation: Causes severe skin burns and eye damage.
Serious eye damage/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. **Summaries of the information derived from the test conducted:**
No data available.
- 11.1.2. **Relevant toxicological properties:**
Acute toxicity:
LD₅₀ (oral, rat): 1000-1500 mg/kg bw
Irritation/corrosion:
Skin: Observed adverse effect (corrosive).
Eyes: Observed adverse effect (irreversible damage).
- 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:
In case of inhalation, ingestion or absorption through skin may cause fatal poisoning. Corrosive substance, may cause burns. The substance is extremely destructive for the mucous membranes, respiratory tract, eyes and skin.
Ingestion: corrosive substance. Inhalation: may cause fatal poisoning. Burns and serious damage in tissues may occur in the respiratory tract. After the inhalation exposition the convulsion of the muscles of the larynx and the bronchia, larynx and bronchia inflammation or laryngeal oedema, pneumonia is likely.
Major symptoms of the poisoning: burning feeling, coughing, wheezing, inflammation of the larynx, laboured breathing, headache, nausea and vomiting.
Skin contact: corrosive substance, causes skin irritation. In case of inhalation, ingestion or absorption through skin may cause fatal poisoning.
Eye contact: may cause strong eye irritation, and in some cases may cause burning.
- 11.1.5. **Delayed and immediate effects as well as chronic effects from short and long-term exposure:**
Harmful if swallowed.
Causes severe skin burns and eye damage.
Fatal 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:**
The substance is not classified as hazardous for the environment.
LC₅₀ (fish): 3.16-4630 mg/l/4 days
LC₀ (fish): 2.15 mg/l/4 days
LC₁₀₀ (fish): 4.64 mg/l/4 days

NOEC (fish): 2.15 mg/l/4 days
EC₅₀ (aquatic invertebrates): 3.644 g/l/48h
EC₅₀ (algae and cyanobacteria): 2 g/l/4 days
NOEC (algae and cyanobacteria): 2 g/l/4 days
EC₅₀ (microorganisms): 1 g/l/3h

12.2. Persistence and degradability:

Phototransformation in air:
Dissipation half-life (DT₅₀): 70.3 – 122.1 h
Decomposition rate constant (OH radicals): 0 - 0 cm³ molecule⁻¹ d⁻¹
Half-life in air: 5 days
Hydrolysis:
Hydrolysis half-life: 12 h (24.85 °C)
Practically insoluble in water, hydrolyzes in contact with water.
In case of hydrolysis hydrochloric acid, carbon dioxide and n-propanol is formed.
Readily biodegradable: 64% - 5 days, 76% - 10 days, 85% - 15 days, 75% - 20 days.

12.3. Bioaccumulative potential:

K_{oc}: 1.9 – 20.7 L/kg (25 °C)
log K_{oc}: 0.28 – 1.3 (25 °C)
The very low K_{oc} indicates no significant adsorption of propanol to soils.
Henry's Law constant H: 0.762 - 420 Pa m³/mol (25 °C) - from the water surface the substance will not evaporate into the atmosphere.
Percent distribution in media: air: 91.2%, water: 8.78%, soil: 0.01%, sediment: 0.01%

12.4. Mobility in soil:

No data available.

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 of in the same manner as the substance.

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:

UN 2740

14.2. UN proper shipping name:

ADR/RID: n-PROPYL CHLOROFORMATE

IMDG: n-PROPYL CHLOROFORMATE

IATA: Air transport of the substance is PROHIBITED!

14.3. Transport hazard class(es):

ADR/RID: 6.1.TFC

Labels: 6.1 + 3 + 8

IMDG: 6.1

14.4. Packing group:

ADR/RID: I

IMDG: I

14.5. Environmental hazards:

ADR/RID: no

IMDG: no

14.6. Special precautions for user:

Passenger Aircraft: Not permitted for transport

Cargo Aircraft: Not permitted for 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 was modified 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 (30. 06. 2020, version CLP_D).

Relevant hazard statements (code and full text) of Sections 2 and 3:

H225 – Highly flammable liquid and vapour.

H302 – Harmful if swallowed.

H314 – Causes severe skin burns and eye damage.

H318 – Causes serious eye damage.

H330 – Fatal if inhaled.

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.
IUCRID: 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.

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

Professional help regarding the explanation of
the safety data sheet:
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www.msds-europe.com

