

SAFETY DATA SHEET

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

1.1. Product identifier:

4-CHLOROBUTYRYL CHLORIDE

IUPAC name: 4-chlorobutyryl chloride

CAS number: 4635-59-0

EC number: 225-059-1

Registration number: 01-2119909302-49-0001; 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: (48) 311-991

Fax: (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):

Corrosive to metals, Hazard Category 1 – H290

Acute toxicity (oral), Hazard Category 4 – H302

Skin corrosion/irritation, Hazard Category 1A – H314

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

Acute toxicity (inhalation), Hazard Category 2 – H330

Hazard statements:

H290 – May be corrosive to metals.

H302 – Harmful if swallowed.

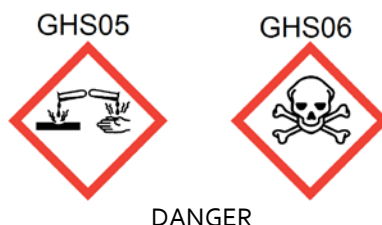
H314 – Causes severe skin burns and eye damage.

H318 – Causes serious eye damage.

H330 – Fatal if inhaled.

2.2. Label elements:

IUPAC name: 4-chlorobutyryl chloride
CAS number: 4635-59-0
EC number: 225-059-1



Hazard statements:

H290 – May be corrosive to metals.
H302 – Harmful if swallowed.
H314 – Causes severe skin burns and eye damage.
H330 – Fatal if inhaled.

EUH 029 – Contact with water liberates toxic gas.

Precautionary statements:

P260 – Do not breathe dust/fume/gas/mist/vapours/spray.
P284 – [In case of inadequate ventilation] wear respiratory protection.
P301 + P312 – IF SWALLOWED: Call a POISON CENTER or a doctor if you feel unwell.
P301 + P330 + P331 – IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 – IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304 + P340 – IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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 doctor/physician.
P403 + P233 – Store in a well-ventilated place. Keep container tightly closed.
P405 – Store locked up.
P501 – Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3. Other hazards:

Information concerning specific hazards for human and environment: see Section 11.
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: 4-chlorobutyryl chloride
Synonym: 4-chlorobutanoyl chloride
CAS number: 4635-59-0
EC number: 225-059-1
Formula: C₄H₆Cl₂O
Molar weight: 141 g/mol
Purity: > 99.5 %

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures:

General information: Immediately remove contaminated clothing. If danger of loss of consciousness, place patient in recovery position and transport accordingly. Apply artificial respiration if necessary. First aid personnel should pay attention to their own safety.

INGESTION:

Measures:

- Rinse mouth immediately and then drink plenty of water.
- Seek medical attention.

INHALATION:

Measures:

- Keep patient calm, remove to fresh air, seek medical attention.
- Immediately inhale corticosteroid dose aerosol.

SKIN CONTACT:

Measures:

- Immediately wash thoroughly with soap and water.
- Seek medical attention.

EYE CONTACT:

Measures:

- Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open.
- Consult an eye specialist.

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:

Treat according to symptoms (decontamination, vital functions), no known specific antidote.
Pulmonary oedema prophylaxis. Medical monitoring for at least 24 hours.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media:

5.1.1. Suitable extinguishing media:

Dry powder, carbon dioxide, foam.

5.1.2. Unsuitable extinguishing media:

Water.

5.2. Special hazards arising from the substance or mixture:

Hazardous decomposition products: hydrogen chloride, carbon oxides, nitrogen oxides.

5.3. Advice for firefighters:

Wear full protective clothing and self-contained breathing apparatus.

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:

Respiratory protection required.

Avoid contact with the skin, eyes and clothing.

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:

For small amounts: Pick up with suitable absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr).

For large amounts: Pump off product.

Cleaning operations should be carried out only while wearing breathing apparatus. Clean contaminated floors and objects thoroughly with water and detergents, observing environmental regulations. Collect waste in suitable containers, which can be labelled and sealed. Incinerate or take to a special waste disposal site in accordance with local authority regulations.

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.

Protect against moisture.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Avoid contact with skin, eyes and clothing, avoid inhalation.

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 (warm water hand washing and showering with soap) is required.

Technical measures:

Ensure thorough ventilation of storage and work areas.

Precautions against fire and explosion:

Vapours may form ignitable mixture with air. Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy.

7.2. Conditions for safe storage, including any incompatibilities:

Technical measures and storage condition:

Avoid extreme heat. Keep container tightly closed and dry. Store in a cool place.

Keep away from sources of ignition - No smoking.

Protect against moisture.

Keep away from direct sunshine and other heat- and explosion sources.

Incompatible materials: See Section 10.5

Packaging material: Container lined with polyethylene, with inert material or polyethylene container. The use of packaging material made of metals is forbidden!

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.

PNEC values:

Freshwater: 0.051 mg/l

Freshwater – intermittent release: 0.506 mg/l

Marine water: 0.005 mg/l

STP: 20 mg/l

Freshwater sediment: 0.43 mg/kg sediment dry weight

Marine water sediment: 0.043 mg/kg sediment dry weight

Soil: 0.056 mg/kg soil dry weight

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

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.

Ensure adequate ventilation, especially in closed areas.

Do not eat or smoke during the processing.

Do not inhale vapours.

Wash and hand wash thoroughly after work.

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

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

Avoid contact with the skin, eyes and clothing.

Do not breathe vapour/spray.

1. **Eye/face protection:** Use appropriate tightly fitting protective glasses and face shield (EN 166).

2. **Skin protection:**

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

Suitable materials also for prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN 374):

- butyl rubber (butyl) - 0.7 mm coating thickness

- fluoroelastomer (FKM) - 0.7 mm coating thickness

Manufacturer's directions for use should be observed because of great diversity of types.

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:** Self-contained breathing apparatus.

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	slightly pink
3. Odour, odour threshold	pungent
4. Melting point/freezing point	-49 °C / 1013 hPa
5. Boiling point or initial boiling point and boiling range	173.5 °C / 1013 hPa
6. Flammability	no data*
7. Lower and upper explosion limit	lower: 5.5 vol. % upper: 11.7 vol. %
8. Flash point	85 °C / 1013 hPa
9. Auto-ignition temperature	440 °C / 1013 hPa
10. Decomposition temperature	120 °C
11. pH	not applicable
12. Kinematic viscosity	1.45 mm ² /s / 20 °C 1.06 mm ² /s / 40 °C
13. Solubility in water in other solvents	decomposes in water no data*
14. Partition coefficient n-octanol/water (log value)	not applicable
15. Vapour pressure	1.31 hPa / 20 °C 8.88 hPa / 50 °C
16. Density and/or relative density	1.258 g/cm ³ at 20 °C

	1.234 g/cm ³ at 40 °C
17. Relative vapour density	4.9 / air=1
18. Particle characteristics	no data*

9.2. Other information:

9.2.1. Information with regard to physical hazard classes:

Oxidizing properties: No oxidising properties.

9.2.2. Other safety characteristics:

Dynamic viscosity: 1.82 mPa.s (20 °C)

1.31 mPa.s (40 °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:

Corrosive effect on metals.

Contact with water liberates toxic gas.

10.2. Chemical stability:

Stable at room temperature and general conditions of work.

10.3. Possibility of hazardous reactions:

Evolution of corrosive gases/vapours. Reacts with water and basic components to generate heat. On contact with water, gaseous decomposition products are formed, which cause build-up of pressure in tightly closed containers. 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. Addition of water leads to increase in temperature. In damp air hydrochloric acid formation is possible. Violent reactions with water and/or alcohols, with formation of hydrochloric acid. Substance/product is highly reactive. Violent and explosive reaction with water. Vapours may form ignitable mixture with air.

10.4. Conditions to avoid:

Avoid direct sunlight. Avoid electro-static charge. Avoid humidity, water. Avoid heat. Avoid prolonged storage. Disregard of the conditions mentioned may result in undesirable decomposition reactions.

10.5. Incompatible materials:

Acids, bases, water, amines and alcohol.

10.6. Hazardous decomposition products:

Contact with water liberates toxic gas: Hydrogen chloride.

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, male/female): 1350 mg/kg bw

LD₅₀ (intraperitoneal, mouse, male/female): 176 mg/kg bw

LC₅₀ (inhalation, vapour, rat, male/female): 0.65 – 0.87 mg/l air/4h

Skin corrosion/irritation:

Rabbit: highly corrosive.

Serious eye damage/eye irritation:

Rabbit: irreversible effects on the eye.

Repeated dose toxicity:

LOAEC (inhalation, vapour, rat, male/female): 0.002 mg/l air (analytical)

Slight effects on transitional and respiratory epithelium at the lowest concentration.

Genetic toxicity:

In vitro gene mutation study in bacteria (*S. typhimurium*): negative.

Cytotoxicity: > 750 µg/plate

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:

No data available.

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.

Aquatic toxicity:

Short-term toxicity to fish:

LC₅₀ (*Leuciscus idus*): 68.12 mg/l/96h

Short-term toxicity to aquatic invertebrates:

EC₅₀ (*Daphnia magna*): 0.492 mg/l/48h

Toxicity to aquatic algae and cyanobacteria:

EC₅₀ (*Pseudokirchneriella subcapitata*): 5.3 mg/l/72h

Toxicity to microorganisms:

EC₂₀ (activated sludge): > 1000 mg/l/30 min

12.2. Persistence and degradability:

In case of contact with water, decomposes. In case of hydrolysis, hydrochloric acid is formed.

Biodegradation in water (aerob, activated sludge): 14 days

12.3. Bioaccumulative potential:

BCF: 3.16 l/kg (log BCF: 0.50)

BAF: 2.28 l/kg (log BAF: 0.46)

12.4. Mobility in soil:

Adsorption coefficient:

Koc: 65 (25 °C, pH 4, 5)

Koc: 49 (25 °C, pH 7)

Koc: 48 (35 °C, pH 9)

log Koc: 1.81 (25 °C, pH 4, 5)

log Koc: 1.69 (25 °C, pH 7, 9)

Henry's Law constant:

H1: ca. 0.024 (25 °C, pH 4)

H2: ca. 0.006 (25 °C, pH 5)

H3: 0 (25 °C, pH 7)

H4: 0 (25 °C, pH 9)

Percent distribution:

Air (%): 1.17

Water (%): 98.5

Soil (%): 0.163

Sediment (%): 0.165

Susp. sediment (%): 0.001

Biota (%): 0

Aerosol (%): 0

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:

Incinerate in suitable incineration plant, observing local authority regulations.

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:

Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.

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 2922

14.2. UN proper shipping name:

ADR/RID: CORROSIVE, TOXIC LIQUID N.O.S. (4-chlorobutyl chloride)

IMDG; IATA: CORROSIVE, TOXIC LIQUID N.O.S. (4-chlorobutyl chloride)

14.3. Transport hazard class(es):

ADR/RID: 8 Classification code: CT1

Labels: 8 + 6.1

IMDG: 8

IATA: 8

- 14.4. Packing group:**
ADR/RID: I
IMDG: I
IATA: I
- 14.5. Environmental hazards:**
ADR/RID: No
IMDG: NO
IATA: No
- 14.6. Special precautions for user:**
No relevant information available.
- 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 (26. 10. 2018, version CLP_E).

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

H290 – May be corrosive to metals.
H302 – Harmful if swallowed.
H314 – Causes severe skin burns and eye damage.
H318 – Causes serious eye damage.
H330 – Fatal if inhaled.
EUH 029 – Contact with water liberates toxic gas.

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.

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

