

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

<b>Name of the substance</b>	Benzyl chloroformate
<b>Identification number</b>	607-064-00-4 (Index number)
<b>Registration number</b>	-
<b>Synonyms</b>	None.
<b>Issue date</b>	20-January-2017
<b>Version number</b>	01
<b>Revision date</b>	-
<b>Supersedes date</b>	-

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

<b>Identified uses</b>	Industrial chemical.
<b>Uses advised against</b>	None known.

### 1.3. Details of the supplier of the safety data sheet

<b>Supplier</b>	VanDeMark Chemical B.V.
<b>Address</b>	Schiekade 830, 3032 AL Rotterdam, The Netherlands
<b>e-mail</b>	sales@vdmchemical.com
<b>Manufacturer</b>	VanDeMark Chemical Inc.
<b>Address</b>	1 North Transit Road, Lockport, NY 14094 USA
<b>Telephone</b>	+1 716-433-6764
<b>e-mail</b>	sales@vdmchemical.com
<b>Manufacturer</b>	Framochem Kft
<b>Address</b>	Szerviz út 5., 3700 Kazincbarcika Hungary

### 1.4. Emergency telephone number

<b>Europe</b>	112
<b>Denmark</b>	Poison Control Hotline (DK): +45 82 12 12 12
<b>France</b>	ORFILA (FR): + 01 45 42 59 5
<b>Germany</b>	Poison Center Berlin (DE): +49 030 30686 790
<b>Italy</b>	Poison Center, Milan (IT): +39 02 6610 1029
<b>Spain</b>	Servicio de Información Toxicológica: +34 91 562 04 20
<b>Switzerland</b>	Poison Center: Tel 145; +41 44 251 51 51

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

The substance has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

#### Classification according to Regulation (EC) No 1272/2008 as amended

##### Health hazards

Acute toxicity, inhalation	Category 3	H331 - Toxic if inhaled.
Skin corrosion/irritation	Category 1B	H314 - Causes severe skin burns and eye damage.
Carcinogenicity	Category 1B	H350 - May cause cancer.
Specific target organ toxicity - single exposure	Category 3 respiratory tract irritation	H335 - May cause respiratory irritation.

##### Environmental hazards

Hazardous to the aquatic environment, long-term aquatic hazard	Category 1	H410 - Very toxic to aquatic life with long lasting effects.
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<b>Hazard summary</b>	Toxic if inhaled. Causes severe skin burns and eye damage. May cause cancer. May cause respiratory irritation. Dangerous for the environment if discharged into watercourses. Occupational exposure to the substance or mixture may cause adverse health effects.
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### 2.2. Label elements

**Label according to Regulation (EC) No. 1272/2008 as amended****Contains:** Benzyl chloride, Benzyl chloroformate**Hazard pictograms****Signal word** Danger**Hazard statements**

H331 Toxic if inhaled.  
 H314 Causes severe skin burns and eye damage.  
 H350 May cause cancer.  
 H335 May cause respiratory irritation.  
 H410 Very toxic to aquatic life with long lasting effects.

**Precautionary statements****Prevention**

P201 Obtain special instructions before use.  
 P202 Do not handle until all safety precautions have been read and understood.  
 P260 Do not breathe mist.  
 P271 Use only outdoors or in a well-ventilated area.  
 P280 Wear protective gloves/protective clothing/eye protection/face protection.  
 P264 Wash thoroughly after handling.  
 P273 Avoid release to the environment.

**Response**

P308 + P313 IF exposed or concerned: Get medical advice/attention.  
 P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
 P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.  
 P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
 P363 Wash contaminated clothing before reuse.  
 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 CENTRE or doctor/physician.  
 P391 Collect spillage.

**Storage**

P405 Store locked up.  
 P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

**Disposal**

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

**Supplemental label information** None.**2.3. Other hazards** Not a PBT or vPvB substance or mixture.**SECTION 3: Composition/information on ingredients****3.1. Substances****General information**

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Benzyl chloroformate	=> 98	501-53-1 207-925-0	-	607-064-00-4	
<b>Classification:</b>	Skin Corr. 1B;H314, Eye Dam. 1;H318, STOT SE 3;H335, Aquatic Acute 1;H400, Aquatic Chronic 1;H410				
Benzyl chloride	=< 1.5	100-44-7 202-853-6	-	602-037-00-3	*
<b>Classification:</b>	Acute Tox. 4;H302, Skin Irrit. 2;H315, Eye Dam. 1;H318, Acute Tox. 3;H331, STOT SE 3;H335, Carc. 1B;H350, STOT RE 2;H373, Aquatic Chronic 2;H411				

**List of abbreviations and symbols that may be used above**

\*: An impurity.

**Composition comments**

The product is a substance with impurities.  
 Occupational Exposure Limits for impurities are listed in Section 8. All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. The full text for all H-statements is displayed in section 16.

**SECTION 4: First aid measures****General information**

First aid personnel must be aware of own risk during rescue.

#### 4.1. Description of first aid measures

<b>Inhalation</b>	Move injured person into fresh air and keep person calm under observation. Get medical attention immediately.
<b>Skin contact</b>	Immediately flush with plenty of water for at least 15 minutes. Get immediate medical attention. Chemical burns must be treated by a physician.
<b>Eye contact</b>	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention immediately. Continue to rinse.
<b>Ingestion</b>	Immediately rinse mouth and drink plenty of water. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical attention immediately.

**4.2. Most important symptoms and effects, both acute and delayed** Contact with this material will cause burns to the skin, eyes and mucous membranes. Permanent eye damage or blindness could result.

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

### SECTION 5: Firefighting measures

**General fire hazards** Will burn if involved in a fire.

#### 5.1. Extinguishing media

**Suitable extinguishing media** Foam. Carbon dioxide. Dry powder.

**Unsuitable extinguishing media** Water. Contact with water liberates toxic gas.

**5.2. Special hazards arising from the substance or mixture** During fire, gases hazardous to health may be formed.

#### 5.3. Advice for firefighters

**Special protective equipment for firefighters** Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Special fire fighting procedures** Use standard firefighting procedures and consider the hazards of other involved materials. Move container from fire area if it can be done without risk. Keep upwind.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** Provide adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Wear necessary protective equipment. See Section 8 for personal protective equipment.

**For emergency responders** Keep unnecessary personnel away.

**6.2. Environmental precautions** Do not allow to enter drains, sewers or watercourses.

**6.3. Methods and material for containment and cleaning up** Absorb spillage with suitable absorbent material. Collect in containers and seal securely. Large spillages: Dike far ahead of liquid spill for later disposal. Containers must be labeled.

**6.4. Reference to other sections** For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

### SECTION 7: Handling and storage

**7.1. Precautions for safe handling** Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Mechanical ventilation or local exhaust ventilation is required. Avoid inhalation of vapours and spray mist and contact with skin and eyes. Wear appropriate personal protective equipment. Wash thoroughly after handling. Contaminated clothing and shoes must be discarded. Observe good industrial hygiene practices.

**7.2. Conditions for safe storage, including any incompatibilities** Store at temperature at or below  $-15^{\circ}\text{C}$  ( $5^{\circ}\text{F}$ ) in a dry, well-ventilated location. All equipment and storage vessels must be constructed of Teflon or glass-lined steel. Keep container tightly closed. Protect from sunlight and avoid any contact with iron. Product is stable when stored properly at recommended storage temperature. Storage in recommended temperatures and conditions will ensure product quality for minimum 12 months before retesting may be needed to determine assay. Storage in conditions between  $-15^{\circ}\text{C}$  ( $5^{\circ}\text{F}$ ) and  $-5^{\circ}\text{C}$  ( $23^{\circ}\text{F}$ ) may require retesting after 6 months to determine assay. Storage above  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) not recommended.

**7.3. Specific end use(s)** Industrial chemical.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

## Occupational exposure limits

### UK. EH40 Workplace Exposure Limits (WELs)

Components	Type	Value
Benzyl chloride (CAS 100-44-7)	STEL	7.9 mg/m <sup>3</sup>
	TWA	1.5 ppm
		2.6 mg/m <sup>3</sup>
		0.5 ppm
<b>Biological limit values</b>	No biological exposure limits noted for the ingredient(s).	
<b>Recommended monitoring procedures</b>	Follow the schedule for work place measurements.	
<b>Derived no effect levels (DNELs)</b>	Not available.	
<b>Predicted no effect concentrations (PNECs)</b>	Not available.	
<b>8.2. Exposure controls</b>		
<b>Appropriate engineering controls</b>	Provide adequate ventilation. Should be handled in closed systems, if possible. Observe occupational exposure limits and minimise the risk of inhalation of vapours and mist. Provide easy access to water supply and eye wash facilities.	
<b>Individual protection measures, such as personal protective equipment</b>		
<b>General information</b>	Use personal protective equipment as required. Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.	
<b>Eye/face protection</b>	Use safety goggles and face shield in case of splash risk.	
<b>Skin protection</b>		
<b>- Hand protection</b>	Wear appropriate chemical resistant gloves. Glove material: Fluoro carbon rubber (0.4 mm). Be aware that the liquid may penetrate the gloves. Frequent change is advisable. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material.	
<b>- Other</b>	Wear appropriate chemical resistant clothing.	
<b>Respiratory protection</b>	Wear suitable respiratory protection. Use respiratory equipment with gas filter, type A2.	
<b>Thermal hazards</b>	When material is heated, wear gloves to protect against thermal burns.	
<b>Hygiene measures</b>	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Observe any medical surveillance requirements.	
<b>Environmental exposure controls</b>	Environmental manager must be informed of all major spillages.	

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

#### Appearance

<b>Physical state</b>	Liquid.
<b>Form</b>	Liquid.
<b>Colour</b>	Clear.
<b>Odour</b>	Pungent.
<b>Odour threshold</b>	Not available.
<b>pH</b>	Not available.
<b>Melting point/freezing point</b>	Not available.
<b>Initial boiling point and boiling range</b>	152 °C (305.6 °F)
<b>Flash point</b>	126.0 °C (258.8 °F)
<b>Evaporation rate</b>	Not available.
<b>Flammability (solid, gas)</b>	Not applicable.

#### Upper/lower flammability or explosive limits

<b>Flammability limit - lower (%)</b>	Not available.
<b>Flammability limit - upper (%)</b>	Not available.

<b>Vapour pressure</b>	Not available.
<b>Vapour density</b>	Not available.
<b>Relative density</b>	1.217 (20 °C)
<b>Solubility(ies)</b>	Not available.
<b>Partition coefficient (n-octanol/water)</b>	
<b>Auto-ignition temperature</b>	Not available.
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not available.
<b>Explosive properties</b>	Not explosive.
<b>Oxidising properties</b>	Not oxidising.

## 9.2. Other information

<b>Surface tension</b>	25 mN/m (20 °C (68 °F))
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## SECTION 10: Stability and reactivity

<b>10.1. Reactivity</b>	Water reactive material.
<b>10.2. Chemical stability</b>	Decomposes on heating. Decomposes in the presence of water.
<b>10.3. Possibility of hazardous reactions</b>	Thermal decomposition or combustion may liberate toxic gases or fumes. Contact with water liberates toxic gas.
<b>10.4. Conditions to avoid</b>	Heat. Moisture. Exposure to air.
<b>10.5. Incompatible materials</b>	Water. Iron Acids. Bases. Alcohols. Metal salts.
<b>10.6. Hazardous decomposition products</b>	Hydrogen chloride. Benzyl alcohol.

## SECTION 11: Toxicological information

<b>General information</b>	Occupational exposure to the substance or mixture may cause adverse effects.
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### Information on likely routes of exposure

<b>Inhalation</b>	Vapours irritate the respiratory system, and may cause coughing and difficulties in breathing. Inhalation of vapors may cause lung oedema.
<b>Skin contact</b>	Corrosive effects. Causes skin burns.
<b>Eye contact</b>	Corrosive. Prolonged contact causes serious eye and tissue damage.
<b>Ingestion</b>	May cause burns of the gastrointestinal tract if swallowed.

<b>Symptoms</b>	Contact with this material will cause burns to the skin, eyes and mucous membranes. Permanent eye damage including blindness could result.
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### 11.1. Information on toxicological effects

<b>Acute toxicity</b>	Toxic if inhaled.
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<b>Components</b>	<b>Species</b>	<b>Test results</b>
Benzyl chloride (CAS 100-44-7)		
<b>Acute</b>		
<b>Inhalation</b>		
LC50	Rat	0.74 mg/l, 4 hours
<b>Oral</b>		
LD50	Rat	340 mg/kg
Benzyl chloroformate (CAS 501-53-1)		
<b>Acute</b>		
<b>Inhalation</b>		
LC50	Rat	590 mg/m <sup>3</sup> , 4 hours
<b>Oral</b>		
LD50	Rat	3 g/kg
<b>Skin corrosion/irritation</b>	Causes severe skin burns.	
<b>Serious eye damage/eye irritation</b>	Causes serious eye damage.	
<b>Respiratory sensitisation</b>	Based on available data, the classification criteria are not met.	
<b>Skin sensitisation</b>	Based on available data, the classification criteria are not met.	
<b>Germ cell mutagenicity</b>	Based on available data, the classification criteria are not met.	
<b>Carcinogenicity</b>	May cause cancer.	

## IARC Monographs. Overall Evaluation of Carcinogenicity

Benzyl chloride (CAS 100-44-7)

2A Probably carcinogenic to humans.

<b>Reproductive toxicity</b>	Based on available data, the classification criteria are not met.
<b>Specific target organ toxicity - single exposure</b>	May cause respiratory irritation.
<b>Specific target organ toxicity - repeated exposure</b>	Based on available data, the classification criteria are not met.
<b>Aspiration hazard</b>	Based on available data, the classification criteria are not met.
<b>Mixture versus substance information</b>	No data available.
<b>Other information</b>	No data available.

## SECTION 12: Ecological information

**12.1. Toxicity** Very toxic to aquatic life with long lasting effects.

Components	Species	Test results	
Benzyl chloride (CAS 100-44-7)			
<b>Aquatic</b>			
Crustacea	EC50	Daphnia magna	1.3 mg/l, 24 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	4.4 - 5.6 mg/l, 96 hours
<b>Other</b>			
Micro-organisms	EC50	Micro-organisms	2.97 mg/l, 30 minutes 2.25 mg/l, 15 minutes 1.92 mg/l, 5 minutes

**12.2. Persistence and degradability** Decomposes in the presence of water.

**12.3. Bioaccumulative potential**

**Partition coefficient n-octanol/water (log Kow)**

Benzyl chloride (CAS 100-44-7)

2.3

**Bioconcentration factor (BCF)** Not available.

**12.4. Mobility in soil** No data available.

**12.5. Results of PBT and vPvB assessment** Not a PBT or vPvB substance or mixture.

**12.6. Other adverse effects** No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

## SECTION 13: Disposal considerations

**13.1. Waste treatment methods**

<b>Residual waste</b>	Dispose of in accordance with local regulations. Avoid discharge into water courses or onto the ground. Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.
<b>Contaminated packaging</b>	Since emptied containers retain product residue, follow label warnings even after container is emptied.
<b>EU waste code</b>	16 03 05* The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
<b>Disposal methods/information</b>	Dispose of in accordance with all applicable regulations. Do not discharge into drains, water courses or onto the ground.
<b>Special precautions</b>	Dispose of in accordance with local regulations.

## SECTION 14: Transport information

**ADR**

<b>14.1. UN number</b>	UN1739
<b>14.2. UN proper shipping name</b>	Benzyl chloroformate
<b>14.3. Transport hazard class(es)</b>	
<b>Class</b>	8
<b>Subsidiary risk</b>	-

Label(s) 8  
Hazard No. (ADR) 88  
Tunnel restriction code E  
14.4. Packing group I  
14.5. Environmental hazards Yes  
14.6. Special precautions Read safety instructions, SDS and emergency procedures before handling.  
for user

#### RID

14.1. UN number UN1739  
14.2. UN proper shipping Benzyl chloroformate  
name  
14.3. Transport hazard class(es)  
Class 8  
Subsidiary risk -  
Label(s) 8  
14.4. Packing group I  
14.5. Environmental hazards Yes  
14.6. Special precautions Read safety instructions, SDS and emergency procedures before handling.  
for user

#### ADN

14.1. UN number UN1739  
14.2. UN proper shipping Benzyl chloroformate  
name  
14.3. Transport hazard class(es)  
Class 8  
Subsidiary risk -  
Label(s) 8  
14.4. Packing group I  
14.5. Environmental hazards Yes  
14.6. Special precautions Read safety instructions, SDS and emergency procedures before handling.  
for user

#### IATA

14.1. UN number UN1739  
14.2. UN proper shipping Benzyl chloroformate  
name  
14.3. Transport hazard class(es)  
Class 8  
Subsidiary risk -  
Label(s) 8  
14.4. Packing group I  
14.5. Environmental hazards Yes  
ERG Code 8L  
14.6. Special precautions Read safety instructions, SDS and emergency procedures before handling.  
for user

#### IMDG

14.1. UN number UN1739  
14.2. UN proper shipping BENZYL CHLOROFORMATE  
name  
14.3. Transport hazard class(es)  
Class 8  
Subsidiary risk -  
Label(s) 8  
14.4. Packing group I  
14.5. Environmental hazards  
Marine pollutant Yes  
EmS F-A, S-B  
14.6. Special precautions Read safety instructions, SDS and emergency procedures before handling.  
for user

14.7. Transport in bulk This substance/mixture is not intended to be transported in bulk.  
according to Annex II of Marpol  
and the IBC Code

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

## EU regulations

**Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended**

Not listed.

**Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended**

Not listed.

**Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended**

Not listed.

**Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended**

Not listed.

**Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA**

Not listed.

## Authorisations

**Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorisation, as amended**

Not listed.

## Restrictions on use

**Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended**

Benzyl chloride (CAS 100-44-7)

**Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.**

Benzyl chloride (CAS 100-44-7)

## Other EU regulations

**Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended**

Benzyl chloride (CAS 100-44-7)

Benzyl chloroformate (CAS 501-53-1)

## Other regulations

Young people under 18 years old are not allowed to work with this product according to the EU Directive 94/33/EC on the protection of young people at work. The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended and respective national laws implementing EC directives. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006 as amended.

## National regulations

Follow national regulation for work with chemical agents.

## 15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out.

## SECTION 16: Other information

### List of abbreviations

DNEL: Derived No-Effect Level.  
PNEC: Predicted No-Effect Concentration.  
PBT: Persistent, bioaccumulative and toxic.  
vPvB: Very Persistent and very Bioaccumulative.

### References

ECHA CHEM  
International Chemical Safety Cards (ICSC)  
GESTIS Substance Database

### Information on evaluation method leading to the classification of mixture

The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available.

### Full text of any H-statements not written out in full under Sections 2 to 15

H302 Harmful if swallowed.  
H314 Causes severe skin burns and eye damage.  
H315 Causes skin irritation.  
H318 Causes serious eye damage.  
H331 Toxic if inhaled.  
H335 May cause respiratory irritation.  
H350 May cause cancer.  
H373 May cause damage to organs through prolonged or repeated exposure.  
H400 Very toxic to aquatic life.  
H410 Very toxic to aquatic life with long lasting effects.



**Training information**

**Disclaimer**

H411 Toxic to aquatic life with long lasting effects.

Follow training instructions when handling this material.

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.