SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

CHLOROFORM (E9000)

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1. Identification of the substance or preparation

Product name	:	CHLOROFORM (E9000)
Chemical Name	:	Trichloromethane
Synonyms	:	Trichlorated methane, Methyl trichloride, Formyl trichloride
Molecular formula	:	$CHCl_3$
Molecular Weight	:	119.4 g/mol

1.2. Use of the Substance/Preparation

Recommended use :
- Chemical intermediate
- Solvent

1.3. Company/Undertaking Identification

Address : SOLVAY CHEMICALS INTERNATIONAL SA
RUE DU PRINCE ALBERT, 44
B- 1050 BRUXELLES

Telephone : +3225096111

Telefax : +3225096624

1.4. Emergency and contact telephone numbers

Emergency telephone : **+44(0)208 762 8322 [CareChem 24] (Europe)**
GB: +44-1925-651277 (Product information)

E-mail address : **sdstracking@solvay.com**

2. HAZARDS IDENTIFICATION

Appearance	:	liquid
Colour	:	colourless
Odour	:	Chloroform

- The product is classified in accordance with Annex I to Directive 67/548/EEC.
- Harmful if swallowed.
- Irritating to skin.
- Limited evidence of a carcinogenic effect.
- Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
- Hazardous decomposition products formed under fire conditions.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name (CAS-No. / EC-No. / Annex-1)	Concentration (W/W)	Classification	R-phrase(s)
Chloroform (67-66-3 / 200-663-8 / 602-006-00-4)	**> 99 %**	Xn Xi Carc.Cat.3	R22, R48/20/22 R38 R40

4. FIRST AID MEASURES

4.1. Inhalation

- In case of accident by inhalation: remove casualty to fresh air and keep at rest.
- Victim to lie down in the recovery position, cover and keep him warm.
- Oxygen or artificial respiration if needed.
- If symptoms persist, call a physician.

4.2. Eye contact

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- In the case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine).
- Immediate medical attention is required.

4.3. Skin contact

- Remove and wash contaminated clothing before re-use.
- Wash off with soap and water.
- If symptoms persist, call a physician.

4.4. Ingestion

- Consult a physician.
- Take victim immediately to hospital.

If victim is conscious:

- If swallowed, rinse mouth with water (only if the person is conscious).
- Do NOT induce vomiting.
- Do not give anything to drink.
- Artificial respiration and/or oxygen may be necessary.

If victim is unconscious but breathing:

- Artificial respiration and/or oxygen may be necessary.

5. FIRE-FIGHTING MEASURES

5.1. Suitable extinguishing media

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Extinguishing media which shall not be used for safety reasons

- None.

5.3. Special exposure hazards in a fire

- The product is not flammable.
- Hazardous decomposition products formed under fire conditions.

5.4. Special protective equipment for fire-fighters

- Evacuate personnel to safe areas.
- Wear self-contained breathing apparatus and protective suit.
- Fire fighters must wear fire resistant personnel protective equipment.
- Clean contaminated surface thoroughly.

5.5. Other information

- Cool containers / tanks with water spray.
- Flood the product with water.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions

- Prevent further leakage or spillage if safe to do so.
- Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
- Wear self-contained breathing apparatus in confined spaces, in cases where the oxygen level is depleted, or in case of significant emissions.
- Keep away from open flames, hot surfaces and sources of ignition.
- Cover the spreading liquid with foam in order to slow down the evaporation.
- Keep away from Incompatible products.
- Ventilate the area.
- Refer to protective measures listed in sections 7 and 8.

6.2. Environmental precautions

- Should not be released into the environment.
- If the product contaminates rivers and lakes or drains inform respective authorities.

6.3. Methods for cleaning up

- Dam up.
- Soak up with inert absorbent material.
- Prevent product from entering drains.
- Keep in properly labelled containers.
- Keep in suitable, closed containers for disposal.
- Treat recovered material as described in the section "Disposal considerations".

7. HANDLING AND STORAGE

7.1. Handling

- Used in closed system
- Handle small quantities under a lab hood.
- Keep away from heat and sources of ignition.
- Prevent product vapours decomposition from contacting hot spots.
- Prevent product vapours decomposition from electric arc action (welding).
- Preferably transfer by pump or gravity.
- Use only equipment and materials which are compatible with the product.
- Keep away from incompatible products

7.2. Storage

- To maintain product quality, do not store in heat or direct sunlight.
- Store in original container.
- Keep container closed.
- Keep in a cool, well-ventilated place.
- Keep away from direct sunlight.
- Keep in a bunded area.
- Do not store in confined space.
- Information about special precautions needed for bulk handling is available on request.
- Keep only in the original container at a temperature not exceeding < 30 °C.

7.3. Specific use(s)

- For further information, please contact: Supplier

7.4. Packaging material

- Steel drum

7.5. Other information

- Keep away from fire, sparks and heated surfaces.
- To avoid thermal decomposition, do not overheat.
- Refer to protective measures listed in sections 7 and 8.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure Limit Values

Chloroform

- UK. EH40 Workplace Exposure Limits (WELs) 2005
  time weighted average = 2 ppm
  time weighted average = 9.9 mg/m3
- UK. EH40 Workplace Exposure Limits (WELs) 2005
  Remarks: Can be absorbed through skin.
- US. ACGIH Threshold Limit Values 01 2006
  time weighted average = 10 ppm
- EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents. 02 2006
  time weighted average = 2 ppm
  time weighted average = 10 mg/m3
- EU. Indicative Exposure and Directives relating to the protection of risks related to work exposure to chemical, physical, and biological agents. 02 2006
  Remarks: Can be absorbed through skin.

8.2. Exposure controls

- Ensure adequate ventilation.
- Provide appropriate exhaust ventilation at machinery.
- Refer to protective measures listed in sections 7 and 8.
- Apply technical measures to comply with the occupational exposure limits.

8.2.1. Occupational exposure controls

8.2.1.1. Respiratory protection

- Self-contained breathing apparatus in medium confinement/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/ national standards.
- Recommended Filter type:
- AX

8.2.1.2. Hand protection

- Wear suitable gloves.
- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).
- Suitable material : PVA, Copolymer VF2-HFP (fluoroelastomer)
- Unsuitable material : Natural Rubber, PVC

8.2.1.3. Eye protection

- Chemical resistant goggles must be worn.
- If splashes are likely to occur, wear:
- Goggles
- Face-shield

8.2.1.4. Skin and body protection

- Protective suit
- Neoprene
- Apron
- Boots

8.2.1.5. Hygiene measures

- Use only in an area equipped with a safety shower.
- Eye wash bottle with pure water
- When using do not eat, drink or smoke.
- High standards of skin care and personal hygiene should be exercised at all times.
- Handle in accordance with good industrial hygiene and safety practice.

8.2.2. Environmental exposure controls

- Dispose of rinse water in accordance with local and national regulations.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General Information (appearance, odour)

Appearance	:	liquid
Colour	:	colourless
Odour	:	Chloroform

9.2. Important health safety and environmental information

pH	:	*Remarks*: not applicable
Boiling point/boiling range	:	= 61 °C
Flash point	:	*Remarks*: none
Flammability	:	*Remarks*: The product is not flammable.
Explosive properties	:	*Explosion danger*: *Remarks*: none
Oxidizing properties	:	*Remarks*: not applicable
Vapour pressure	:	207 hPa *Temperature*: 20 °C
Relative density / Density	:	1.48
Solubility	:	Water 8 g/l *Temperature*: 20 °C
	:	Soluble in:
	:	organic solvent
	:	Greases
Partition coefficient: n-octanol/water	:	*log Pow*: 1.97
Viscosity	:	0.57 mPa.s *Temperature*: 20 °C
Vapour density	:	4.1

9.3. Other data

Freezing point:	:	-64 °C
Auto-flammability	:	*Remarks*: The product is not flammable.
Decomposition temperature	:	> 290 °C

10. STABILITY AND REACTIVITY

10.1. Stability
- Stable under recommended storage conditions.

10.2. Conditions to avoid
- To avoid thermal decomposition, do not overheat.
- Keep away from direct sunlight.
- Exposure to moisture.

10.3. Materials to avoid
- Strong bases, Oxidizing agents, Salts of metals, Non iron metals (aluminium, magnesium, zinc, ...), Certain plastic materials

10.4. Hazardous decomposition products
- hydrochloric acid, Carbon monoxide, Phosgene

11. TOXICOLOGICAL INFORMATION

11.1 Toxicological data

Acute oral toxicity
- LD50, rat, 908 - 2,000 mg/kg

Acute inhalation toxicity
- LC50, 4 h, rat, 47.7 mg/l

Acute dermal toxicity
- LD50, rabbit, > 3,980 mg/kg

Skin irritation
- rabbit, Mild skin irritation

Eye irritation
- rabbit, Mild eye irritation

Sensitisation
- no data available

Chronic toxicity
- Oral, Repeated exposure, mouse, Target Organs**:** Liver, NOEL**:** >= 40 mg/kg
- Inhalation, Repeated exposure, Various species, Target Organs**:** Liver, Kidney, Central nervous system, NOEL**:** >= 0.125 mg/l

Carcinogenicity
- Oral, Prolonged exposure, rat/mouse, Target Organs**:** Liver, Kidney, carcinogenic effects

Teratogenicity
- Foetotoxic and fertility effects

Possible hazards (summary)
- Harmful if swallowed.
- Liver and kidney injuries may occur.
- Risk of the central nervous system effect
- The carcinogenic effect is not demonstrated in human
- Ambiguous mutagenic effect

11.2. Health effects

Main effects
- The product causes irritation of eyes, skin and mucous membranes.
- Liver and kidney injuries may occur.
- other central nervous effects
- Use of alcoholic beverages may enhance toxic effects.

Inhalation
- Feelings of intoxication, restlessness, dizziness, nausea, vomiting, drowsiness.
- May cause cardiac arrhythmia.
- In case of repeated or prolonged exposure: headaches, fatigue and risk of nervous system effects.
- Repeated or prolonged exposure: Liver and kidney injuries may occur..
- (in case of higher concentration): narcosis, cardiorespiratory failure.

Eye contact
- Severe eye irritation
- Lachrymation
- Redness
- Risk of temporary eye lesions.

Skin contact
- Cold sensation followed by redness of the skin.
- Repeated exposure may cause skin dryness or cracking.
- Chronic exposure may cause dermatitis.

Ingestion
- Irritation of the mouth and throat.
- Feelings of intoxication, restlessness, dizziness and drowsiness.
- Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

Acute toxicity
- Fishes, Salmo gairdneri, LC50, 96 h, 18 mg/l
  Remarks: fresh water
- Fishes, Limanda limanda, LC50, 96 h, 28 mg/l
  Remarks: salt water
- Crustaceans, Daphnia magna, EC50, 48 h, 29 mg/l
  Remarks: fresh water
- Crustaceans, Artemia salina, EC50, 24 h, 37 mg/l
  Remarks: salt water

Chronic toxicity
- Fishes, Poecilia reticulata, LC50, 14 Days, 102 mg/l
- Fishes, Salmo gairdneri, LC50, 27 Days, from 1.24 - 2.3 mg/l
  Remarks: fish embryos
- Crustaceans, Daphnia magna, NOEC, Reproduction Test, 21 Days, 13 mg/l
- Algae, Scenedesmus subspicatus, EC50, biomass, 48 h, 560 mg/l
  Remarks: fresh water
- Algae, Scenedesmus subspicatus, EC50, growth rate, 48 h, 950 mg/l
  Remarks: fresh water
- Algae, Skeletonema costatum, EC50, growth rate/biomass, 5 Days, ca. 450 mg/l
  Remarks: salt water

12.2. Mobility
- Air, Henry's law constant (H) ca. 330 hPa.m³/mol , 20 °C
  Remarks: Very volatile.
- Water, Evaporates., t1/2: < 1 h
  Conditions: Concentration: 1 ppm
- Water, Evaporates., t1/2: from 1 - 30 Days
  Conditions: Concentration: 1 ppb - 1 ppm
- Soil/sediments, log KOC:from 1.6 - 2
  Remarks: significant evaporation and percolation

12.3. Persistence and degradability

Abiotic degradation

- Air, indirect photo-oxidation, t 1/2 from 60 - 100 d
  Result: non-significant photolysis
  Conditions: sensitizer: OH radicals
- Air, indirect photo-oxidation, t 1/2 from 10 - 15 d
  Conditions: sensitizer: photochemical smog
- Water, Hydrolysis, t 1/2 > 1,000 y
  Result: non-significant hydrolysis and photolysis
  Conditions: neutral, pH
- Soil
  Result: non-significant hydrolysis

Biodegradation

- aerobic, Tested according to: Inherently biodegradable., 100 %, 28 d
  Conditions: adapted culture
  Remarks: Inherently biodegradable.
- anaerobic, Tested according to: methanogenesis, 88 %, 28 d
  Result: dehalogenation
  Remarks: Inherently biodegradable.
- aerobic, Tested according to: ready biodegradability/MITI, 14 d
  Remarks: Not readily biodegradable.

12.4. Bioaccumulative potential

- Bioconcentration: Fishes, Cyprinus carpio, Bioconcentration factor (BCF) from 4.1 - 13, 42 d, 0.1 mg/l
- log Pow < 3
  Result: Does not bioaccumulate.

12.5. Other adverse effects

- no data available

12.6. Possible hazards (summary)

- Harmful to aquatic organisms.
- Nevertheless, hazard for the environment is limited due to product properties:
- Disperses rapidly in air.
- Inherently biodegradable.
- Does not bioaccumulate.
- . weak persistence.

13. DISPOSAL CONSIDERATIONS

13.1. Waste from residues / unused products

- In accordance with local and national regulations.
- Refer to manufacturer/supplier for information on recovery/recycling.
- or
- Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.
- The incinerator must be equipped with a system for the neutralisation or recovery of HCl.

13.2. Packaging treatment

- Empty containers.
- Dispose of as unused product.
- To avoid treatments, as far as possible, use dedicated containers.
- or
- Rinse the empty containers with a low volatility hydrocarbon and treat the effluent in the same way as waste.

14. TRANSPORT INFORMATION

UN-Number **1888**

IATA-DGR

Class	6.1
Packing group	III
ICAO-Labels	Toxic

Proper shipping name: CHLOROFORM

IMDG

Class	6.1
Packing group	III
IMDG-Labels	toxic
HI/UN No.	1888
EmS:	F-A, S-A

Proper shipping name: CHLOROFORM

ADR

Class	6.1
Packing group	III
ADR/RID-Labels	6.1
HI/UN No.	60/1888

Proper shipping name: CHLOROFORM

RID

Class	6.1
Packing group	III
ADR/RID-Labels	6.1
HI/UN No.	60/1888

Proper shipping name: CHLOROFORM

15. REGULATORY INFORMATION

15.1. EC Label

- Hazardous components which must be listed on the label: Chloroform
- This substance is classified and labelled according to Annex I of Directive 67/548/EEC, as amended.

Symbol(s)	Xn	Harmful
R-phrase(s)	R22	Harmful if swallowed.
	R38	Irritating to skin.
	R40	Limited evidence of a carcinogenic effect.
	R48/20/22	Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
S-phrase(s)	S 2	Keep out of the reach of children.
	S36/37	Wear suitable protective clothing and gloves.

15.2. Other information

- EC Label

15.3. Inventory Information

Toxic Substance Control Act list (TSCA)	: -	In compliance with inventory.

Australian Inventory of Chemical Substances (AICS)	: -	In compliance with inventory.
Canadian Domestic Substances List (DSL)	: -	In compliance with inventory.
Korean Existing Chemicals List (ECL)	: -	In compliance with inventory.
EU list of existing chemical substances (EINECS)	: -	In compliance with inventory.
Japanese Existing and New Chemical Substances (MITI List) (ENCS)	: -	In compliance with inventory.
Inventory of Existing Chemical Substances (China) (IECS)	: -	In compliance with inventory.
Philippine Inventory of Chemicals and Chemical Substances (PICCS)	: -	In compliance with inventory.
New Zealand Inventory of Chemicals (NZIOC)	: -	In compliance with inventory.

15.4. Other regulations

- European Waste Catalogue, Decision (2000/532/EC), Hazardous waste, Waste codes should be assigned by the user based on the application for which the product was used., The following Waste Codes are only suggestions:
- 14 06 02 (Halogenated solvents and solvents mixes)
- Dir. 76/769/EEC: Not to be used in substances and preparations placed on the market for sale to the general public in concentration >= 0.1 % with following mention "Restricted to professional users".
- For use in industrial installations only.

16. OTHER INFORMATION

16.1. Administrative information

- Update
  This data sheet contains changes from the previous version in section(s): 1.4
- Distribute new edition to clients

16.2. Text of R phrases mentioned in Section 3

- R22**:** Harmful if swallowed.
- R38**:** Irritating to skin.
- R40**:** Limited evidence of a carcinogenic effect.
- R48/20/22**:** Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

This SDS is only intended for the indicated country to which it is applicable. The European SDS format compliant with the applicable European legislation is not intended for use nor distribution in countries outside the European Union with the exception of Norway and Switzerland. Safety datasheets applicable in other countries/regions are available upon request.
The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. This applies to product which conforms to the specification, unless otherwise stated. In this case of combinations and mixtures one must make sure that no new dangers can arise. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and protection of human welfare and the environment.