

CHLORO FORM (CHLOROFORM)

Date of compilation: 14-08-2026 | Revised: 14-08-2026 | Version: 1

SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

CHLOROFORM (CHLORO FORM)
Synonyms: Trichloromethane; Methyl trichloride; Formyl trichloride
CAS: 67-66-3

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Chemical intermediate (e.g. for HCFC-22/PTFE precursor chemistry), laboratory reagent/solvent, extraction solvent for industrial processes. For industrial/closed-system use only. For industrial user only.
Uses advised against: All uses not specified in this section or in section 7.3.

1.3 Supplier's details:

SURAJ CHEMICALS
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1.4 Emergency phone number:

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SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Acute Tox. 3	Acute oral toxicity, Category 3, H301
Acute Tox. 3	Acute inhalation toxicity, Category 3, H331
Skin Irrit. 2	Skin irritation, Category 2, H315
Eye Irrit. 2	Eye irritation, Category 2, H319
Carc. 2	Carcinogenicity, Category 2, H351
Repr. 2	Reproductive toxicity, Category 2, H361d
STOT RE 1	Specific target organ toxicity, repeated exposure, Category 1, H372

2.2 GHS label elements, including precautionary statements:

GHS: Danger

Hazard statements:

Acute Tox. 3: H301 – Toxic if swallowed.
Acute Tox. 3: H331 – Toxic if inhaled.
Skin Irrit. 2: H315 – Causes skin irritation.
Eye Irrit. 2: H319 – Causes serious eye irritation.
Carc. 2: H351 – Suspected of causing cancer.
Repr. 2: H361d – Suspected of damaging the unborn child.
STOT RE 1: H372 – Causes damage to organs (liver, kidneys, central nervous system) through prolonged or repeated exposure.

Precautionary statements:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe vapours.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.
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.
P308+P313: IF exposed or concerned: Get medical advice/attention.
P314: Get medical advice/attention if you feel unwell.
P405: Store locked up.
P501: Dispose of the contents/containers in accordance with regulations on hazardous waste.

2.3 Other hazards which do not result in classification:

Non-flammable liquid; thermal decomposition (contact with flame/hot surfaces) generates highly toxic phosgene and hydrogen chloride gases. Does not meet the PBT/vPvB criteria per current assessment; ozone-depleting/greenhouse gas considerations are not applicable to this substance.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

Chemical description: Chloroform (Trichloromethane, industrial/technical grade)
In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 67-66-3	Chloroform — Acute Tox. 3: H301, H331; Skin Irrit. 2: H315; Eye Irrit. 2: H319; Carc. 2: H351; Repr. 2: H361d; STOT RE 1: H372 – Danger	≥ 99.5% (typically stabilized with a small amount of ethanol or amylene)

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

3.2 Mixtures:
Non-applicable

SECTION 4: FIRST AID MEASURES

- 4.1 Description of necessary first-aid measures:
Request medical assistance immediately, showing the SDS of this product.
- By inhalation:
Remove the person affected from the area of exposure immediately, provide fresh air and keep at rest. In serious cases, artificial resuscitation and immediate medical assistance will be necessary.
- By skin contact:
Remove contaminated clothing immediately, wash skin thoroughly with plenty of water and soap. Seek medical attention.
- By eye contact:
Rinse eyes thoroughly with lukewarm water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek medical attention.
- By ingestion/aspiration:
Do NOT induce vomiting (risk of aspiration). Rinse the mouth with water. Seek IMMEDIATE medical attention, showing the SDS of the product.
- 4.2 Most important symptoms/effects, acute and delayed:
Acute and delayed effects are indicated in sections 2 and 11.
- 4.3 Indication of immediate medical attention and special treatment needed, if necessary:
Inform medical personnel of the substance identity; toxic and carcinogenic effects, as well as reproductive toxicity concerns, warrant prompt and thorough medical evaluation.

SECTION 5: FIRE-FIGHTING MEASURES

- 5.1 Suitable extinguishing media:
Suitable: Water spray/fog, foam, carbon dioxide, dry chemical powder (product itself is non-flammable; select media for surrounding fire)
Unsuitable: None known
- 5.2 Specific hazards arising from the chemical:
Non-flammable liquid. Thermal decomposition (contact with open flame, hot metal surfaces, or welding operations) generates highly toxic phosgene and hydrogen chloride gases.
- 5.3 Special protective actions for fire-fighters:
Evacuate all non-essential personnel. Intervention only by capable personnel who are trained and aware of the hazards of the product. In all cases wear self-contained breathing apparatus. When intervention in close proximity, wear full protective chemical-resistant suit. After intervention, proceed to clean the equipment (take a shower, remove clothing carefully, clean and check).
- Additional provisions:
Cool fire-exposed containers with water spray from a safe distance. Use self-contained breathing apparatus due to the significant risk of toxic decomposition gases (phosgene).

SECTION 6: ACCIDENTAL RELEASE MEASURES

- 6.1 Personal precautions, protective equipment and emergency procedures:
For non-emergency personnel:
Ventilate the area. Evacuate non-essential personnel. Contain the spill provided there is no additional risk, using appropriate respiratory and skin protection (see section 8).
For emergency responders:
Wear protective equipment. Keep unprotected persons away. See section 8.
- 6.2 Environmental precautions:
Avoid release to drains, watercourses or soil. Contain spillage with inert absorbent material. Notify the relevant authority in case of any environmental release.
- 6.3 Methods and materials for containment and cleaning up:
Absorb with inert non-combustible absorbent material (sand, vermiculite) and place in a labelled, closed container for disposal by a licensed hazardous waste contractor. Ventilate the area thoroughly after clean-up.
- 6.4 Reference to other sections:
See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

- 7.1 Precautions for safe handling:
A. General precautions for safe use:
Handle in closed systems with full local exhaust ventilation to minimise exposure – this is a suspected human carcinogen with toxic and reproductive toxicity hazards. Avoid all skin/eye contact and inhalation of vapours. Keep away from heat and open flame to prevent thermal decomposition.
- B. Technical recommendations for the prevention of fires and explosions:
No special fire-prevention measures required (non-flammable); keep away from open flame, welding operations and hot surfaces to prevent phosgene generation.
- C. Technical recommendations on general occupational hygiene:
Do not eat or drink during the process; wash hands afterwards with suitable cleaning products.
- D. Technical recommendations to prevent environmental risks:
Provide tight electrical equipment well protected against corrosion. Avoid atmospheric emissions. Warn people about the dangers of the product. Follow the protective measures given in the exposure controls/personal protection section. In industrial installations, apply the rules for the prevention of major accidents (consult an expert).
- 7.2 Conditions for safe storage, including any incompatibilities:
A. Specific storage requirements:
- | | |
|---------------|---|
| Minimum Temp. | 5°C |
| Maximum Temp. | 30°C (cool, well-ventilated, locked/access-controlled area, protected from light) |
| Maximum time | 12 Months in original sealed, stabilized packaging |
- B. General conditions for storage:
Store in a cool, dark, well-ventilated, access-controlled area, in tightly closed, amber/light-protected containers, away from heat, open flame and strong oxidizing agents. Chloroform may slowly decompose to phosgene if the stabiliser is depleted; monitor stock rotation. For additional information see subsection 10.5.
- 7.3 Specific end use(s):
Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

- 8.1 Control parameters:
Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987):
- | Identification | Occupational Exposure Limit Type | Value |
|----------------------------|---|--------|
| Chloroform
CAS: 67-66-3 | ACGIH TLV – TWA (8 hrs, A3 confirmed animal carcinogen) | 10 ppm |
- 8.2 Appropriate engineering controls:
It is recommended to use localized extraction in the work area as a collective protection measure to avoid exceeding occupational exposure limits, in addition to individual protective equipment (PPE) as needed. Consult the

manufacturer's information leaflet for storage, use, cleaning and maintenance of PPE.

B. Respiratory protection:

Supplied-air respirator or full-face respirator with organic vapour cartridge; engineering controls (closed systems, local exhaust ventilation) should be the primary control.

C. Specific protection for the hands:

Chemical-resistant gloves (e.g. Viton®; nitrile/neoprene have limited breakthrough time against chlorinated solvents). Replace frequently.

D. Eye and face protection:

Chemical splash goggles and face shield.

E. Bodily protection:

Chemical-resistant full-body protective clothing for operations with exposure potential.

F. Additional emergency measures:

Emergency shower (ANSI Z358-1, ISO 3864-1:2011, ISO 3864-4:2011) and eyewash stations (DIN 12 899, ISO 3864-1:2011, ISO 3864-4:2011) should be available.

Environmental exposure controls:

Avoid environmental spillage of both the product and its container. See subsection 7.1.D.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	
Physical state at 20°C	Liquid
Appearance	Clear, mobile liquid
Color	Colorless
Odor	Sweet, ether-like
Odour threshold	~85–200 ppm
Volatility	
Boiling point at atmospheric pressure	61.2°C
Vapour pressure at 20°C	~160 mmHg (21.3 kPa)
Evaporation rate (n-BuAc = 1)	~11 (very fast)
Product Description	
Density / Relative density at 20°C	1.48 g/cm³
Dynamic / Kinematic viscosity at 20°C	~0.56 mPa·s
Concentration	≥ 99.5%
pH	Not applicable (non-aqueous)
Vapour density (air = 1)	~4.1 (heavier than air)
Partition coefficient n-octanol/water (log Pow)	1.97
Solubility in water at 20°C	~8 g/L (low)
Decomposition temperature	Available on request (decomposes on prolonged contact with air/light/heat, forming phosgene)
Melting point/freezing point	-63.5°C
Flammability	
Flash Point	Non-applicable (non-flammable liquid)
Flammability (solid, gas)	Non-flammable
Autoignition temperature	Not relevant *
Lower / Upper flammability limit	Not relevant *
Particle Characteristics	
Median equivalent diameter	Non-applicable (liquid)

* Not relevant due to the nature of the product, not providing information on the properties of its hazards.

9.2 Other information:

Explosive properties	Not explosive
Oxidising properties	Not an oxidizer
Corrosive to metals	Can corrode certain metals (e.g. aluminium) especially in the presence of moisture
Heat of combustion	Not relevant (non-combustible)
Surface tension at 20°C	~27 mN/m
Refraction index	~1.446

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity:

Slowly decomposes on prolonged exposure to air, light and moisture, forming phosgene and hydrogen chloride – hence supplied stabilized (e.g. with ethanol or amylene) and stored in dark containers. Reacts with strong oxidizing agents, strong alkalis (in the presence of certain metals, can form hazardous reactive intermediates) and reactive metals (e.g. aluminium, magnesium).

10.2 Chemical stability:

Chemically stable under the indicated conditions of storage, handling and use.

10.3 Possibility of hazardous reactions:

Thermal decomposition (heat, flame, hot surfaces) generates toxic phosgene and hydrogen chloride gases. Contact with strong alkalis and finely divided reactive metals can cause hazardous reactions. Under recommended, stabilized storage conditions no other hazardous reactions are expected.

10.4 Conditions to avoid:

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Slow decomposition (phosgene formation) if unstabilized	Avoid open flame/hot surfaces	Avoid direct light exposure – accelerates decomposition	Avoid prolonged moisture contact with reactive metals

10.5 Incompatible materials:

Strong Oxidizing Agents	Strong Alkalis	Reactive Metals (Al, Mg powder)	Open Flame / Hot Surfaces
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Avoid contact	Avoid contact – hazardous reaction risk	Avoid contact – vigorous reaction risk	Avoid – toxic decomposition gases (phosgene)
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10.6 Hazardous decomposition products:
Phosgene and hydrogen chloride on thermal decomposition or prolonged exposure to air/light without adequate stabiliser.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:
In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect):
Toxic if swallowed. May cause gastrointestinal irritation, nausea, vomiting, and central nervous system depression; can cause liver and kidney damage.

B. Inhalation (acute effect):
Toxic if inhaled. Vapours cause irritation of the respiratory tract, headache, dizziness and, at high concentrations, central nervous system depression, cardiac arrhythmia risk and unconsciousness.

C. Contact with skin and eyes (acute effect):
Causes skin irritation and serious eye irritation.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):
Suspected of causing cancer (Carc. 2, H351) based on animal study evidence (liver/kidney tumours). Suspected of damaging the unborn child (Repr. 2, H361d). IARC: Group 2B (possibly carcinogenic to humans). Classification criteria for mutagenicity are not met based on available data.

E. Sensitizing effects:
Classification criteria for respiratory or skin sensitisation are not met based on available data.

F. Specific target organ toxicity (STOT) – single exposure:
Vapours can cause CNS depression (headache, dizziness, narcosis) and cardiac sensitisation at high acute concentrations; addressed principally via the acute toxicity classification (H331).

G. Specific target organ toxicity (STOT) – repeated exposure:
Causes damage to organs (liver, kidneys, central nervous system) through prolonged or repeated exposure (H372) – well documented hepatotoxic and nephrotoxic effects from chronic exposure in occupational and animal studies.

H. Aspiration hazard:
Classification criteria are not met based on available data.

Product-specific toxicological information:

Identification	Acute Toxicity	Genus
Chloroform (Trichloromethane, industrial/technical grade) CAS: 67-66-3	LD50 oral: 908 mg/kg	Rat
	LD50 dermal: Available on request	–
	LC50 inhalation: 47.7 mg/L (4h)	Rat

SECTION 12: ECOLOGICAL INFORMATION

Harmful to aquatic life; not formally classified for aquatic hazard at current harmonized classification, but should be prevented from entering the environment given CMR properties.

12.1 Toxicity:

Identification	Acute Toxicity	Species	Genus
Chloroform CAS: 67-66-3	LC50: 18.8 mg/L (96h)	Pimephales promelas	Fish
	EC50: 28.9 mg/L (48h)	Daphnia magna	Crustacean

12.2 Persistence and degradability:
Not readily biodegradable under standard test conditions; volatilises significantly from water and soil surfaces.

12.3 Bioaccumulative potential:
Low-to-moderate bioaccumulation potential (log Pow 1.97).

12.4 Mobility in soil:

Koc	Henry	Dry Soil	Moist Soil
~35–100	~3.7×10 ⁻³ atm·m³/mol (volatilises readily)	Volatilises	Low solubility, some dissolution

12.5 Results of PBT and vPvB assessment:
This substance does not meet the PBT/vPvB criteria of Annex XIII.

12.6 Other adverse effects:
Not described

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Disposal methods:
Recover/recycle under closed-system conditions where feasible. Otherwise incinerate in a licensed hazardous waste incinerator equipped for halogenated solvent combustion with acid-gas scrubbing, in accordance with local regulations. For packaging: do not rinse; dispose of as hazardous waste.
Refer to national and local regulations on waste management, including the Hazardous and Other Wastes (Management and Transboundary Movement) Rules.

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023):

14.1 UN number	UN1888
14.2 UN proper shipping name	CHLOROFORM
14.3 Transport hazard class(es)	6.1
14.4 Packing group	III
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22):

14.1 UN number	UN1888
14.2 UN proper shipping name	CHLOROFORM
14.3 Transport hazard class(es)	6.1
14.4 Packing group	III

14.5 Marine pollutant	No
14.6 Special precautions for user	EmS Codes: F-A, S-A Limited quantities: 5 L Segregation group: Not relevant
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024):

14.1 UN number	UN1888
14.2 UN proper shipping name	CHLOROFORM
14.3 Transport hazard class(es)	6.1
14.4 Packing group	III
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question:

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation:

Manufacture, Storage and Import of Hazardous Chemicals Rules 1989
The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
Public Liability Insurance Act, 1991

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3:

H301: Toxic if swallowed.
H331: Toxic if inhaled.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H351: Suspected of causing cancer.
H361d: Suspected of damaging the unborn child.
H372: Causes damage to organs through prolonged or repeated exposure.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training:

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources:

The United Nations Economic Commission for Europe (UNECE); European Chemicals Agency (ECHA) classification and labelling inventory; ACGIH Threshold Limit Values.

Abbreviations and acronyms:

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | COD: Chemical Oxygen Demand | BOD5: 5-day biochemical oxygen demand | BCF: Bioconcentration factor | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Log-POW: Octanol-water partition coefficient | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

END OF SAFETY DATA SHEET