



SRF LIMITED

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SAFETY DATA SHEET

CHLOROFORM

SECTION 1: IDENTIFICATION OF SUBSTANCE OR MIXTURE AND COMPANY

- 1.1 **Product Name** : CHLOROFORM
- Trade Names / Synonyms** : Trichloromethane; Methyl trichloride; Methane trichloride
- CAS Number** : 67-66-3
- 1.2 **Manufacturer/supplier** : SRF Limited, D-2/1 GIDC Phase-II, PCPIR, Dahej, Tal. Vagra, Dist. Bharuch 392 130, Gujarat (India)
- Further information obtainable from:** : Vikas Yadav
e-mail: vikas.yadav1@srf.com
Mobile no. +91-9978445120
- 1.3 **Emergency Call**
- Emergency Contact** : Balwada Ashish +91-9099002602
- Primary Contact** : Prabhat Kumar +91-7069057087
- SDS Contact** : Sharma Anil +91-9687694067
Kumar

Relevant Identified Uses Of The Substance Or Mixture And Uses Advised Against

Identified Uses: : Commonly used as solvent in Agrochemicals, Pharmaceuticals industries

Uses advised against: : Do not use product for anything outside of the above specified uses

SECTION 2: HAZARDS IDENTIFICATION

- 2.1 **This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).**

Classification of the substance or mixture	SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A CARCINOGENICITY - Category 2 A REPRODUCTIVE TOXICITY- Category 2 Specific target organ toxicity (single exposure) - Category 2 {Target Organs - Central nervous system (CNS)} Specific target organ toxicity - (repeated exposure)-Category 1 (Target Organs - Liver, Kidney, Blood)
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**GHS leble element
Hazard Pictogram:**



Single word: Warning

Hazard Statement(s):

H302	Harmful if swallowed
H315	Causes skin irritation
H319	Causes serious eye irritation
H331	Toxic if inhaled.
H351	Suspected of causing cancer
H361	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure

Precautinary Statement(s):

P201	Obtain special instructions before use
P202	Do not handle until all safety precautions have been read and understood
P261	Avoid breathing vapors
P264	Wash face, hands and any exposed skin thoroughly after handling
P271	Use only outdoors or in a well-ventilated area
P280	Wear protective gloves/protective clothing/eye protection/face protection
P281	Use personal protective equipment as required
P391	Collect spillage.
P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330	Rinse mouth.
P302+P352	IF ON SKIN: Wash with plenty of soap and water
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove lenses, if present and easy to do. Continue rinsing
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up

SECTION 3: COMPOSITION & INFORMATION ON INGREDIENTS

Chemical name	Common name and synonyms	Formula	CAS No.	Concentration % (w/w)
Chloroform	Formyl trichloride, Methane trichloride, Methenyl trichloride, Methyl trichloride, Trichloromethane	CHCl ₃	67-66-3	>= 99.9 - <= 100

SECTION 3: FIRST AID MEASURES

4.1 Description of first aid measures

General advice : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Get medical attention.

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed:

Potential acute health effects

Eye contact : Causes serious eye irritation
 Inhalation : No known significant effects or critical hazards
 Ingestion : No known significant effects or critical hazards
 Inhalation : No known significant effects or critical hazards

Over-exposure signs/symptoms

Eye contact	Adverse symptoms may include the following:, pain or irritation, watering, redness
Inhalation	No specific data
Skin contact	Adverse symptoms may include the following:, irritation, redness
Ingestion	No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	:In case of inhalation of decomposition products in a fire, symptoms may be delayed.
Specific treatments	: No specific treatment.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or Self-contained breathing

	<p>apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.</p>
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SECTION 5. FIRE FIGHTING MEASURE

5.1	<p>General Fire Hazards</p> <p>Extinguishing media Suitable extinguishing media:</p>	<p>:</p> <p>:</p>	<p>Heat may cause the containers to explode.</p> <p>Use an extinguishing agent suitable for the surrounding fire.</p> <p>Apply water from a safe distance to cool container and protect surrounding area.</p> <p>If involved in fire, shut off flow immediately if it can be done without risk.</p> <p>In adaption to materials stored in the immediate neighborhood.</p>
5.2	<p>Special hazards arising from the substance or mixture</p> <p>Hazardous Combustion Products:</p> <p>Advice for firefighters Special fire fighting procedures:</p> <p>Special protective equipment for firefighters:</p>	<p>:</p> <p>:</p> <p>:</p> <p>:</p>	<p>Non-combustible liquid. Vapors heavier than air. Ambient fire may liberate hazardous vapors. The following may develop in event of fire: Hydrochloric acid, phosgene, chlorine.</p> <p>If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition, Carbon monoxide (CO) Carbon dioxide (CO₂) Hydrogen chloride gas Phosgene</p> <p>In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Wear neoprene gloves during cleaning up work after a fire. Exposure to decomposition products may be a hazard to health.</p> <p>In case of fire: Stop leak if safe to do so. Continue water spray from protected position until container stays cool. Use extinguisher to contain the fire. Isolate the source of the fire or let it burn out. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.</p> <p>Fire-fighters must use standard protective equipment including flame retardant coat, helmet with face shield, Gloves, rubber boots, and in enclosed spaces, SCBA.</p>

SECTION 6: ACCIDENTAL RELEASE MEASURES

- 6.1 **Personal precautions, protective equipment and emergency procedures** : Evacuate area. Provide adequate ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Do not inhale vapors, mist or gas. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
- 6.2 **Environmental Precautions** : Contain or absorb leaking liquid with sand or earth, consults an expert. Prevent liquid entering sewers, basements and workpits. If substance has entered a watercourse or sewer or contaminated soil, advise police.
- 6.3 **Methods and material for containment and cleaning up** : Spillage: May react with combustible substances creating fire or explosion hazard and formation of toxic fumes. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Soak up with inert absorbent material (e.g. sand, silica gel). Prevent liquid entering sewers, basements and workpits; vapor may create explosive atmosphere. Transfer to covered steel drums. Dispose of promptly.
- 6.4 **Reference to other sections** : **Refer to sections 8 and 13.**

SECTION 7: HANDLING & STORAGE

- 7.1 **Precautions for safe handling:** : Keep container tightly closed. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only in area provided with appropriate exhaust ventilation. Do not breathe vapors or spray mist. Avoid contact with skin, eyes and clothing. Do not empty into drains
- 7.2 **Conditions for safe storage, including any incompatibilities:** : Keep tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Keep out of direct sunlight and away from incompatible materials. Store in original container. Electrical equipment should be protected to the appropriate standard.
- 7.3 **Storage temperature** : Protect from sunlight. Store in a cool and well-ventilated place.
- 7.4 **Storage period** : No data available

SECTION 8 : EXPOSURE CONTROL / PERSONAL PROTECTION CONTROL PARAMETERS

- 8.1 **Control parameters, e.g., occupational exposure limit values or biological limit values**

Occupational Exposure Limits:

Component	Source	Value	Note
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Chloroform	US (OSHA)	TWA: 9.78 mg/m ³	OSHA Occupational Exposure Limits
Chloroform	ACGIH	TWA: 49 mg/m ³	ACGIH (United States, 1996).
Chloroform	NIOSH IDLH	STEL: 2 ppm 60 minute(s). STEL: 9.78 mg/m ³ 60 minute(s).	United States, 6/2008).
Chloroform	US (ACGIH)	TWA: 10 ppm 8 hour(s). TWA: 49 mg/m ³ 8 hour(s).	ACGIH Hreshold Exposure Limit Values
Chloroform	OSHA PEL	CEIL: 50 ppm CEIL: 240 mg/m ³	United States, 11/2006).

8.2 **Exposure controls**

Engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Personal protective equipment

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Recommended: Viton.

Eye/Faceprotection : Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166

Protective Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Environmental exposure controls: : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: PHYSICAL & CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	:	Clear colorless liquid
Physical state	:	Liquid
Colour	:	Colourless
Odor	:	Pleasant. Ethereal.
Molecular Weight	:	119.37 g/mole
pH (15 aqueous solution)	:	Specific data not available
Melting point/freezing point	:	-63°C (-81.4°F)
Initial boiling point and boiling range	:	60.5°C (140.9°F)
Evaporation Rate	:	11.6 (Butyl acetate = 1)
Flash point	:	Specific data not available
Flammability (solid, gas)	:	Not applicable
Viscosity	:	100% (v/v)
Partition coefficient; n-octanol/water	:	No data available
Vapour pressure	:	22.3 kPa (167 mm Hg)
Vapour density	:	4.1 (Air = 1.0)
Relative density	:	1.49
Specific Gravity	:	1.484 (Water = 1)
Flammability Range	:	Not determined
Auto-ignition temperature	:	Not determined
Decomposition temperature	:	290 °C
Water solubility	:	Partially soluble in water
Partition coefficient n-octanol/water(ies)	:	Not determined

SECTION 10: STABILITY & REACTIVITY

10.1	Reactivity	:	None known, based on information available
10.2	Chemical stability	:	Stable under ordinary conditions of use and storage

- 10.3 **Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur
- 10.4 **Conditions to avoid** : The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions.
- 10.5 **Incompatible materials** : Strong oxidizers, strong caustics, plastics, rubber, nitric acid, water + heat, and chemically active metals, such as aluminium and magnesium powder, sodium, potassium, and lithium. Avoid contact with open flames and electrical arcs. Liquid methylene chloride will attack some forms of plastics, rubber, and coatings
- 10.6 **Hazardous decomposition products** : Emits highly toxic fumes of phosgene when heated to decomposition. Decomposes in a flame or hot surface to form toxic gas phosgene and corrosive mists of hydrochloric acid. Carbon dioxide and carbon monoxide may form when heated to decomposition

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute Toxicity

LC50 inhalation rat	47702 mg/m ³
LD50 Oral	695 mg/kg (Rat) 4 h
LD50 Dermal	>20 g/kg (Rat)

Sensitization	No information available
Mutagenicity	Suspected of causing genetic defects.
Reproductive toxicity	Suspected of damaging the unborn child.
Teratogenicity	No known significant effects or critical hazards
Specific target organ toxicity (single exposure)	May cause drowsiness or dizziness Central nervous system (CNS)
Specific target organ toxicity (repeated exposure)	Oral - Causes damage to organs through prolonged or repeated exposure. Kidney & Liver
Aspiration hazard	Not available

Carcinogenicity	Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
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Carcinogenicity table						
Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
CHLOROFORM	67-66-3	2B	Possible	A3	-	A3

IARC (International Agency for Research on Cancer)	IARC (International Agency for Research on Cancer)
	Group 1 - Carcinogenic to Humans
	Group 2A - Probably Carcinogenic to Humans
	Group 2B - Possibly Carcinogenic to Humans
IARC (International Agency for Research on Cancer)	

NTP (National Toxicity Program)	NTP: (National Toxicity Program)
	Known - Known Carcinogen
	Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)	A1 - Known Human Carcinogen
	A2 - Suspected Human Carcinogen
	A3 - Animal Carcinogen
	ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens	Mexico - Occupational Exposure Limits - Carcinogens
	A1 - Confirmed Human Carcinogen
	A2 - Suspected Human Carcinogen
	A3 - Confirmed Animal Carcinogen
	A4 - Not Classifiable as a Human Carcinogen
A5 - Not Suspected as a Human Carcinogen	

Potential acute health effects

Eye contact	: Causes serious eye irritation
Inhalation	: May cause adverse liver and kidney effect.
Skin contact	: Adverse symptoms may include the following: irritation, redness
Ingestion	: Significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	: Adverse symptoms may include the following:, pain or irritation, watering, redness
Inhalation	: May cause adverse liver and kidney effect.
Skin contact	: Adverse symptoms may include the following:., irritation, redness
Ingestion	: Significant effects or critical hazards.
<u>Potential chronic health effects</u>	
Not available	
General	: Significant effects or critical hazards.
Carcinogenicity	: May cause cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity	: Suspected of causing genetic defects.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.
Symptoms / effects, both acute and delayed	: Vomiting, Cough, irritant effects, Shortness of breath, respiratory arrest, narcosis, Dizziness, Nausea, agitation, spasms, inebriation, Headache, Stomach/intestinal disorders, ataxia (impaired locomotor coordination), cardiovascular disorders Drying-out effect resulting in rough and chapped skin. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: ECOLOGICAL INFORMATION

12.1- Toxicity

Product /ingredient name	Result	Species	Exposure
Chloroform	Acute EC50 950 mg/L	Algae	48 hours
	Acute EC50 560 mg/L	Algae	48 hours
	Acute LC50 81.5 to 106mg/L Marine water	Crustaceans - Northern pink shrimp - Penaeus duorarum - 35 to 50 mm	48 hours
	Acute LC50 65.7 mg/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Acute LC50 17.1 mg/L	Fish – Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours
	Acute LC50 758000 to 850000 ug/L	Daphnia - Water flea - Daphnia magna - Young	48 hours
	Acute LC50 13300 to 20800 ug/L	Fish - Bluegill - Lepomis macrochirus	96 hours

12.2-Persistence and degradability

Persistence and degradability	No data available
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12.3-Bioaccumulative potential

BCF fish	No information available
Log Pow	2
Log Kow	Not applicable
Bioaccumulative potential	No information available

12.4-Mobility in Soil

Mobility in soil	Is not likely mobile in the environment due its low water solubility.
Ecology - soil	Will likely be mobile in the environment due to its volatility

12.5-Other adverse effect

Harmful to aquatic life with long lasting effects.




SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

Product : Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification

Contaminated packaging : Evaporate or incinerate residue at an approved site. Return empty containers to supplier.

SECTION 14: TRANSPORT INFORMATION

ITEM	DOT	IMDG	IATA
UN number	1888	1888	1888
Proper shipping name	CHLOROFORM	CHLOROFORM	CHLOROFORM
Transport hazard class(es)/ Labelling Number	 6.1	 6.1	 6.1
Packaging Group	III	III	III
Environmental hazards	No	No	No

Additional information

Other information : No supplementary information available

Special transport precautions

: Always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage

15. REGULATORY INFORMATION

CHLOROFORM (67-66-3) is found on the following regulatory list

15.1 US Federal regulations

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
CHLOROFORM	67-66-3	>99.5	0.1

SARA 311/312 Hazard Categories	Acute, chronic
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CERCLA	This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA)
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Component	Hazardous Substances RQs	CERCLA EHS RQs
CHLOROFORM	10 lb	-

U.S. Department of Homeland Security	This product does not contain any DHS chemicals.
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California Proposition 65	This product contains the following Proposition 65 chemicals.
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Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
CHLOROFORM	67-66-3	Carcinogen	20 µg/day (ingestion) 40 µg/day (inhalation)	Carcinogen

State or local regulations	U.S. - Massachusetts – Right to Know U.S. - New Jersey - Right to Know U.S. - New York - Right to Know U.S. - Pennsylvania - Right to Know
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U.S. Department of Transportation

Reportable Quantity (RQ)	Y
DOT Marine Pollutant	N
DOT Severe Marine Pollutant	N

15.2 International regulations

National Inventory	Status
Australia - AICS	This material is listed or exempted
Canada - DSL	This material is listed or exempted
Europe - EINEC / ELINCS	This material is listed or exempted
Japan - ENCS	Not determined
China	Not determined



Taiwan	This material is listed or exempted
Korea - KECI	This material is listed or exempted
New Zealand - NZIoC	This material is listed or exempted
Philippines	This material is listed or exempted
State or local regulations	U.S. - Massachusetts – Right to Know U.S. - New Jersey - Right to Know U.S. - New York - Right to Know U.S. - Pennsylvania - Right to Know

SECTION 16: OTHER INFORMATION

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. SRF Limited-Chemical business shall not be held liable for any damage resulting from handling or from contact with the above product.