Safety Data Sheet

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Product Name | **Tetrafluoromethane**

Synonyms | Carbon Tetrafluoromethane; Carbon Tetrafluororide; FC 14; Fluorocarbon 14; Freon 14, Halon 14; R-14

CAS Number | 75-73-0

Product Code | 20159

EC Number | 200-896-5

Molecular Formula | :C 1:F 4:

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

Relevant identified use(s) | Refrigerant; gaseous insulator; propellant in insecticidal aerosols, as a solvent; chemical intermediate; dry etchant in microchip manufacture.

1.3 Details of the supplier of the safety data sheet

Manufacturer | Air Liquide

2700 Post Oak Blvd.
Houston, TX 77056
United States
www.us.airliquide.com
sds@airliquide.com

Telephone (Technical) | 713-896-2896

Telephone (Technical) | 800-819-1704

1.4 Emergency telephone number

Manufacturer | 800-424-9300

Manufacturer | +1 703-527-3887

Section 2: Hazards Identification

EU/EEC

According to Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP | Liquefied Gas - H280

DSD/DPD | Not classified - Classification criteria not met

2.2 Label Elements

CLP

WARNING

Hazard statements | H280 - Contains gas under pressure; may explode if heated

Precautionary statements

Storage/Disposal | P403 - Store in a well-ventilated place.

DSD/DPD

Risk phrases | No label element(s) required

2.3 Other Hazards

CLP | This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.
According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD | This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.
This product is not considered dangerous under the European Directive 67/548/EEC

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012 | Liquefied Gas - H280
Simple Asphyxiant
Hazards Not Otherwise Classified - Health Hazard - Frostbite

2.2 Label elements

OSHA HCS 2012

WARNING

Hazard statements | Contains gas under pressure; may explode if heated - H280
May displace oxygen and cause rapid suffocation.
Contact with rapidly expanding gas may cause burns or frostbite.

Precautionary statements

Storage/Disposal | Store in a well-ventilated place. - P403

2.3 Other hazards

OSHA HCS 2012 | Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to WHMIS

2.1 Classification of the substance or mixture

WHMIS | Compressed Gas - A

2.2 Label elements

WHMIS

Compressed Gas - A

2.3 Other hazards

WHMIS

This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.
In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

2.4 Other information

NFPA

Section 3 - Composition/Information on Ingredients

3.1 Substances

Composition					
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**	**Comments**
Carbon tetrafluoride	**CAS:**75-73-0 **EINECS:**200-896-5	>= 99%	NDA	**EU DSD/DPD:** Not Classified - Classification criteria not met **EU CLP:** Self Classified: Press. Gas - Liq.., H280 **OSHA HCS 2012:** Press. Gas - Liq.; Simp. Asphyx.; HNOC (Health) - Frostbite	NDA

3.2 Mixtures

Material does not meet the criteria of a mixture in accordance with Regulation (EC) No 1272/2008.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. If signs/symptoms continue, get medical attention.

Skin

If frostbite has occurred, seek medical attention immediately; do NOT rub the affected area(s) or flush them with water. In order to prevent further tissue damage, do NOT attempt to remove frozen clothing from frostbitten areas. If frostbite has not occurred, immediately and thoroughly wash contaminated skin with soap and water.

Eye

If eye tissue is frozen, seek medical attention immediately; if tissue is not frozen, immediately and thoroughly flush the eyes with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation, pain, swelling, lacrimation or photophobia persist, get medical attention as soon as possible.

Ingestion | If frostbite has occurred, seek medical attention immediately; do NOT rub the affected area(s) or flush them with water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

| Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician | All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

4.4 Other information

| Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO GASES WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn. Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media | Use extinguishing agent suitable for type of surrounding fire.
SMALL FIRES: Dry chemical or CO_2.
LARGE FIRES: Water spray or fog.

Unsuitable Extinguishing Media | No data available

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards | Containers may explode when heated.
Ruptured cylinders may rocket.

Hazardous Combustion Products | No data available

5.3 Advice for firefighters

| Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.
Wear positive pressure self-contained breathing apparatus (SCBA).
Move containers from fire area if you can do it without risk.
FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.
FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out.
FIRE INVOLVING TANKS: Do not direct water at source of leak or safety devices; icing may occur.
FIRE INVOLVING TANKS: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
FIRE INVOLVING TANKS: ALWAYS stay away from tanks engulfed in fire.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions | Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not touch or walk through spilled material. Ventilate the area before entry.

Emergency Procedures | Stop leak if you can do it without risk. Keep unauthorized personnel away. Keep out of low areas. Stay upwind. Do not direct water at spill or source of leak. LARGE SPILL: Consider initial downwind evacuation for at least 500 meters (1/3 mile)

6.2 Environmental precautions

| Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures | Stop leak if you can do it without risk.
Do not direct water at spill or source of leak.
Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.
If possible, turn leaking containers so that gas escapes rather than liquid.
Isolate area until gas has dispersed.
Ventilate the area.
Allow substance to evaporate.

6.4 Reference to other sections

| Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling | Use only with adequate ventilation. Ventilate closed spaces before entering. Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Cylinders should be firmly secured to prevent falling or being knocked-over. Do not attempt to repair, adjust, or in any other way modify cylinders. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container.

7.2 Conditions for safe storage, including any incompatibilities

Storage | Store in a cool, dry, well-ventilated place. Protect cylinders against physical damage. Cylinders should be firmly secured to prevent falling or being knocked-over.

7.3 Specific end use(s)

| Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines | Currently there are no applicable exposure limits established for this material.

8.2 Exposure controls

Engineering Measures/Controls | Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory | In case of insufficient ventilation, wear suitable respiratory equipment.

Eye/Face | Wear safety glasses.

Skin/Body	Wear leather gloves when handling cylinders.
Environmental Exposure Controls	Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Gas	Appearance/Description	Colorless gas with no odor.
Color	Colorless	Odor	Odorless
Odor Threshold	Data lacking		
General Properties			
Boiling Point	-127.8 C(-198.04 F)	Melting Point	-183.6 C(-298.48 F)
Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	Data lacking	Water Solubility	Slightly Soluble
Viscosity	Data lacking	Explosive Properties	Not explosive.
Oxidizing Properties:	Not an oxidizing gas.		
Volatility			
Vapor Pressure	760 mmHg (torr) @ -127.7 C(-197.86 F)	Vapor Density	Data lacking
Evaporation Rate	Data lacking		
Flammability			
Flash Point	Not relevant	UEL	Not relevant
LEL	Not relevant	Autoignition	Not relevant
Flammability (solid, gas)	Not flammable.		
Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4 Conditions to avoid

Excess heat.

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

No data available

Section 11 - Toxicological Information

11.1 Information on toxicological effects

GHS Properties	Classification
Acute toxicity	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Aspiration Hazard	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Carcinogenicity	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Germ Cell Mutagenicity	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Skin corrosion/Irritation	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Skin sensitization	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
STOT-RE	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
STOT-SE	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Toxicity for Reproduction	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Respiratory sensitization	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Serious eye damage/Irritation	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met

Route(s) of entry/exposure | Inhalation, Skin, Eye, Ingestion

Potential Health Effects

Inhalation

Acute (Immediate) | If this material is released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with decreased levels of oxygen: increase in breathing and pulse rate, emotional upset, abnormal fatigue, nausea, vomiting, collapse, loss of consciousness, convulsive movements, respiratory collapse and death.

Chronic (Delayed) | No data available

Skin

Acute (Immediate) | Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.

Chronic (Delayed) | Under normal conditions of use, no health effects are expected.

Eye

Acute (Immediate) | Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.

Chronic (Delayed) | No data available

Ingestion

Acute (Immediate) | Ingestion can cause burns similar to frostbite.

Chronic (Delayed) | No data available

Section 12 - Ecological Information

12.1 Toxicity

| Material data lacking.

12.2 Persistence and degradability

| Material data lacking.

12.3 Bioaccumulative potential

| Material data lacking.

12.4 Mobility in Soil

| Material data lacking.

12.5 Results of PBT and vPvB assessment

| PBT and vPvB assessment has not been conducted for this material.

12.6 Other adverse effects

| No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste | Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste | Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	UN1982	Tetrafluoromethane or Refrigerant gas R 14	2.2	NDA	NDA
TDG	UN1982	"REFRIGERANT GAS R 14, COMPRESSED; or TETRAFLUOROMETHANE, COMPRESSED	2.2	NDA	NDA
IMO/IMDG	UN1982	TETRAFLUOROMETHANE	2.2	NDA	NDA
IATA/ICAO	UN1982	Tetrafluoromethane	2.2	NDA	NDA

14.6 Special precautions for user | Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

14.7 Transport in bulk according to Annex II of | Not relevant.

MARPOL 73/78 and the IBC Code

Section 15 - Regulatory Information

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

SARA Hazard Classifications | Acute, Pressure(Sudden Release of)

State Right To Know				
Component	**CAS**	**MA**	**NJ**	**PA**
Carbon tetrafluoride	75-73-0	No	Yes	No

Inventory						
Component	**CAS**	**Canada DSL**	**Canada NDSL**	**China**	**EU EINECS**	**EU ELNICS**
Carbon tetrafluoride	75-73-0	Yes	No	Yes	Yes	No

Inventory (Con't.)		
Component	**CAS**	**TSCA**
Carbon tetrafluoride	75-73-0	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

- Carbon tetrafluoride — 75-73-0 — A

Canada - WHMIS - Ingredient Disclosure List

- Carbon tetrafluoride — 75-73-0 — Not Listed

Environment

Canada - CEPA - Priority Substances List

- Carbon tetrafluoride — 75-73-0 — Not Listed

China

Environment

China - Ozone Depleting Substances - First Schedule

- Carbon tetrafluoride — 75-73-0 — Not Listed

China - Ozone Depleting Substances - Second Schedule

- Carbon tetrafluoride — 75-73-0 — Not Listed

China - Ozone Depleting Substances - Third Schedule

- Carbon tetrafluoride — 75-73-0 — Not Listed

Other

China - Annex I & II - Controlled Chemicals Lists

- Carbon tetrafluoride — 75-73-0 — Not Listed

China - Dangerous Goods List

- Carbon tetrafluoride — 75-73-0

China - Export Control List - Part I Chemicals

• Carbon tetrafluoride	75-73-0	Not Listed

Europe

Other

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification

• Carbon tetrafluoride	75-73-0	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits

• Carbon tetrafluoride	75-73-0	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling

• Carbon tetrafluoride	75-73-0	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations

• Carbon tetrafluoride	75-73-0	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases

• Carbon tetrafluoride	75-73-0	Not Listed

Germany

Environment

Germany - TA Luft - Types and Classes

• Carbon tetrafluoride	75-73-0	Not Listed

Germany - Water Classification (VwVwS) - Annex 1

• Carbon tetrafluoride	75-73-0	Not Listed

Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes

• Carbon tetrafluoride	75-73-0	Not Listed

Germany - Water Classification (VwVwS) - Annex 3

• Carbon tetrafluoride	75-73-0	Not Listed

Other

Germany - Specifically Regulated Chemicals in TRGS

• Carbon tetrafluoride	75-73-0	Not Listed

Portugal

Other

Portugal - Prohibited Substances

• Carbon tetrafluoride	75-73-0	Not Listed

United Kingdom

Environment

United Kingdom - Pollution Inventory - Schedule 1 - Thresholds for Releases to Air

• Carbon tetrafluoride	75-73-0	Not Listed

Other

United Kingdom - Workplace Exposure Limits (WELs) - Substances in Review

• Carbon tetrafluoride	75-73-0	Not Listed

United Kingdom - List of Dangerous Substances in Water

• Carbon tetrafluoride	75-73-0	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Carbon tetrafluoride	75-73-0	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Carbon tetrafluoride	75-73-0	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Carbon tetrafluoride	75-73-0	Not Listed

United States - Pennsylvania

Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

• Carbon tetrafluoride	75-73-0	Not Listed

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

• Carbon tetrafluoride	75-73-0	Not Listed

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Last Revision Date | 08/December/2014

Preparation Date | 25/July/2012

Disclaimer/Statement of Liability | To the best of Air Liquide's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this gas mixture is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

Key to abbreviations

NDA = No Data Available