



MATHESON

ask. . .The Gas Professionals™

Safety Data Sheet

Material Name: 1,2-DICHLOROTETRAFLUOROETHANE

SDS ID: MAT06980

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

1,2-DICHLOROTETRAFLUOROETHANE

Synonyms

1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE; MTG MSDS 44; SYM-DICHLOROTETRAFLUOROETHANE; DICHLOROTETRAFLUOROETHANE; CRYOFLUORANE; ARCTON 33; FRIGEN 114; FLUOROCARBON 114; FREON 114; FRIGIDERM; GENETRON 114; GENETRON 316; LEDON 114; PROPELLANT 114; REFRIGERANT 114; CRYOFLURAN; FC 114; C2Cl2F4

Chemical Family

halogenated, aliphatic

Product Use

Industrial and Specialty Gas Applications.

Restrictions on Use

None known.

Details of the supplier of the safety data sheet

MATHESON TRI-GAS, INC.

150 Allen Road, Suite 302

Basking Ridge, NJ 07920

General Information: 1-800-416-2505

Emergency #: 1-800-424-9300 (CHEMTREC)

Outside the US: 703-527-3887 (Call collect)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

Gases Under Pressure - Liquefied gas

GHS Label Elements

Symbol(s)



Signal Word

Warning

Hazard Statement(s)

Contains gas under pressure; may explode if heated.

Precautionary Statement(s)

Prevention

None needed according to classification criteria.

Response

None needed according to classification criteria.

Storage

Protect from sunlight. Store in a well-ventilated place.

Disposal

Dispose in accordance with all applicable regulations.

Other Hazards

**MATHESON**

ask. . .The Gas Professionals™

Safety Data Sheet

Material Name: 1,2-DICHLOROTETRAFLUOROETHANE**SDS ID: MAT06980**

May cause frostbite upon sudden release of liquefied gas.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
76-14-2	1,2-DICHLOROTETRAFLUOROETHANE	100

Section 4 - FIRST AID MEASURES**Inhalation**

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin

If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115°F; 41-46°C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

Eyes

Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Then get immediate medical attention.

Ingestion

If swallowed, get medical attention.

Most Important Symptoms/Effects**Acute**

frostbite

Delayed

no information on significant adverse effects.

Note to Physicians

Treat symptomatically and supportively.

Section 5 - FIRE FIGHTING MEASURES**Extinguishing Media****Suitable Extinguishing Media**

regular dry chemical, carbon dioxide, Large fires: Use water spray, fog or regular foam.

Unsuitable Extinguishing Media

Do not direct water at source of leak or safety devices; icing may occur.

Special Hazards Arising from the Chemical

Negligible fire hazard. Containers may rupture or explode if exposed to heat.

Hazardous Combustion Products

halogens, Chlorine, acid halides, Phosgene

Fire Fighting Measures

Move container from fire area if it can be done without risk. Damaged cylinders should be handled only by specialists. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Use extinguishing agents appropriate for surrounding fire. Apply water from a protected location or from a safe distance. Do not get water directly on material. Reduce vapors with water spray. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.

Special Protective Equipment and Precautions for Firefighters

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

**MATHESON**

ask. . .The Gas Professionals™

Safety Data Sheet

Material Name: 1,2-DICHLOROTETRAFLUOROETHANE**SDS ID: MAT06980**

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up

Stop leak if possible without personal risk. Do not direct water at spill or source of leak. Do not touch or walk through spilled material. Keep unnecessary people away, isolate hazard area and deny entry. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. If possible, turn leaking containers so that gas escapes rather than liquid. Prevent entry into waterways, sewers, basements, or confined areas. Allow substance to evaporate. Ventilate the area. Stay upwind and keep out of low areas.

Environmental Precautions

Avoid release to the environment.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Observe good hygiene and safety practices when handling this product. Wear appropriate chemical resistant clothing. Wash hands thoroughly after handling.

Conditions for Safe Storage, Including any Incompatibilities

Protect from sunlight. Store in a well-ventilated place.

Store and handle in accordance with all current regulations and standards. Protect from sunlight. Store in a well-ventilated area. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

Incompatible Materials

metals, combustible materials

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

1,2-DICHLOROTETRAFLUOROETHANE	76-14-2
ACGIH:	1000 ppm TWA
NIOSH:	1000 ppm TWA ; 7000 mg/m3 TWA
	15000 ppm IDLH
OSHA (US):	1000 ppm TWA ; 7000 mg/m3 TWA
Mexico:	1000 ppm TWA VLE-PPT ; 7000 mg/m3 TWA VLE-PPT
	1250 ppm STEL [PPT-CT] ; 8760 mg/m3 STEL [PPT-CT]

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)

There are no biological limit values for any of this product's components.

Engineering Controls

Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment**Eye/face protection**

Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin Protection

For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.



Safety Data Sheet

Material Name: 1,2-DICHLOROTETRAFLUOROETHANE**SDS ID: MAT06980****Respiratory Protection**

The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA. 10,000 ppm. Any supplied-air respirator. 15,000 ppm. Any supplied-air respirator operated in a continuous-flow mode. Any self-contained breathing apparatus with a full facepiece. Any supplied-air respirator with a full facepiece. Emergency or planned entry into unknown concentrations or IDLH conditions -. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode. Escape -. Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister. Any appropriate escape-type, self-contained breathing apparatus.

Glove Recommendations

Wear insulated gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	clear colorless liquefied gas	Physical State	gas
Odor	faint odor ,sweet odor	Color	colorless
Odor Threshold	Not available	pH	Not available
Melting Point	-94 °C (-137 °F)	Boiling Point	3.6 °C (38 °F)
Boiling Point Range	Not available	Freezing point	Not available
Evaporation Rate	<1 (Ether = 1)	Flammability (solid, gas)	Not available
Autoignition Temperature	Not available	Flash Point	(Not flammable)
Lower Explosive Limit	Not available	Decomposition temperature	Not available
Upper Explosive Limit	Not available	Vapor Pressure	1427 mmHg @ 20 °C
Vapor Density (air=1)	5.93	Specific Gravity (water=1)	1.5312 at 0 °C
Water Solubility	0.11 g/L (@ 20 °C)	Partition coefficient: n-octanol/water	Not available
Viscosity	0.0118 cp	Kinematic viscosity	Not available
Solubility (Other)	Not available	Density	Not available
KOC	815 (Estimate)	Log KOW	2.8
Physical Form	liquefied gas	Volatility	100 %
Molecular Formula	F2-C-Cl-C-Cl-F2	Molecular Weight	170.92

**MATHESON**

ask. . .The Gas Professionals™

Safety Data Sheet

Material Name: 1,2-DICHLOROTETRAFLUOROETHANE**SDS ID: MAT06980****Solvent Solubility****Soluble**

alcohol, ether, butane, Benzene, Toluene, carbon tetrachloride, ketones, esters, organic acids, Hydrocarbons

Insoluble

glycols, phenols

Section 10 - STABILITY AND REACTIVITY**Reactivity**

No reactivity hazard is expected.

Chemical Stability

Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions

Will not polymerize.

Conditions to Avoid

Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.

Incompatible Materials

metals, combustible materials

Hazardous decomposition products

halogens, Chlorine, acid halides, Phosgene

Section 11 - TOXICOLOGICAL INFORMATION**Information on Likely Routes of Exposure****Inhalation**

nausea, vomiting, dizziness, tingling sensation, suffocation, convulsions, coma

Skin Contact

blisters, frostbite

Eye Contact

frostbite, blurred vision

Ingestion

frostbite

Acute and Chronic Toxicity**Component Analysis - LD50/LC50**

The components of this material have been reviewed in various sources and the following selected endpoints are published:

1,2-DICHLOROTETRAFLUOROETHANE (76-14-2)

Inhalation LC50 Rat 52500 ppm 4 h

Product Toxicity Data**Acute Toxicity Estimate**

Inhalation - Gas

> 20000 ppm

Immediate Effects

frostbite

Delayed Effects

no information on significant adverse effects.

Irritation/Corrosivity Data

No data available.

Respiratory Sensitization

No data available.

Dermal Sensitization

**MATHESON**

ask. . .The Gas Professionals™

Safety Data Sheet

Material Name: 1,2-DICHLOROTETRAFLUOROETHANE**SDS ID: MAT06980**

No data available.

Component Carcinogenicity

1,2-DICHLOROTETRAFLUOROETHANE	76-14-2
ACGIH:	A4 - Not Classifiable as a Human Carcinogen

Germ Cell Mutagenicity

No data available.

Tumorigenic Data

No data available

Reproductive Toxicity

No data available.

Specific Target Organ Toxicity - Single Exposure

No data available.

Specific Target Organ Toxicity - Repeated Exposure

No data available.

Aspiration hazard

Not applicable.

Medical Conditions Aggravated by Exposure

heart or cardiovascular disorders, respiratory disorders

Additional Data

Stimulants such as epinephrine may induce ventricular fibrillation.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

No LOLI ecotoxicity data are available for this product's components.

Persistence and Degradability

Biodegradable.

Bioaccumulative Potential

Bioconcentration potential in aquatic organisms is moderate based on a BCF value of 82 (estimated).

Mobility

Expected to have moderate mobility in soil.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose in accordance with all applicable regulations.

Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components.

Section 14 - TRANSPORT INFORMATION

US DOT Information:**Shipping Name:** 1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE**Hazard Class:** 2.2**UN/NA #:** UN1958**Required Label(s):** 2.2**IMDG Information:****Shipping Name:** 1,2-DICHLORO-1,1,2,2-TETRAFLUOROETHANE**Hazard Class:** 2.2



Safety Data Sheet

Material Name: 1,2-DICHLOROTETRAFLUOROETHANE**SDS ID: MAT06980**

UN#: UN1958

Required Label(s): 2.2

International Bulk Chemical Code

This material does not contain any chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

Section 15 - REGULATORY INFORMATION**U.S. Federal Regulations**

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

1,2-DICHLOROTETRAFLUOROETHANE	76-14-2
SARA 313:	1 % de minimis concentration

SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories

Gas Under Pressure

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
1,2-DICHLOROTETRAFLUOROETHANE	76-14-2	Yes	Yes	Yes	Yes	No

Not listed under California Proposition 65**Canada Regulations****Canadian WHMIS Ingredient Disclosure List (IDL)**

Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

1,2-DICHLOROTETRAFLUOROETHANE	76-14-2
	1 %

WHMIS Classification

A

Component Analysis - Inventory**1,2-DICHLOROTETRAFLUOROETHANE (76-14-2)**

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2	KR - REACH CCA	CN	NZ	MX	TW	VN - NCI (Draft)
Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No

Section 16 - OTHER INFORMATION**NFPA Ratings**

Health: 1 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

**MATHESON**

ask. . .The Gas Professionals™

Safety Data Sheet

Material Name: 1,2-DICHLOROTETRAFLUOROETHANE**SDS ID: MAT06980****Summary of Changes**

Updated: 05/01/2015

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations (US); CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC - European Commission; EEC - European Economic Community; EIN - European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL) , KR - Korea; LD50/LC50 - Lethal Dose/ Lethal Concentration; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX - Mexico; NDSL - Non-Domestic Substance List (Canada); NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL - Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH - Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TCCA - Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TW - Taiwan; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UN/NA - United Nations /North American; US - United States; VLE - Exposure Limit Value (Mexico); VN NCI (Draft) - Vietnam National Chemicals Inventory (NCI) (Draft); WHMIS - Workplace Hazardous Materials Information System (Canada) .

Other Information**Disclaimer:**

Matheson Tri-Gas, Inc. makes no express or implied warranties, guarantees or representations regarding the product or the information herein, including but not limited to any implied warranty or merchantability or fitness for use. Matheson Tri-Gas, Inc. shall not be liable for any personal injury, property or other damages of any nature, whether compensatory, consequential, exemplary, or otherwise, resulting from any publication, use or reliance upon the information herein.