

Safety Data Sheet

**Section 1: Identification of the Substance/Mixture and of the Company/Undertaking****1.1 Product identifier**

Product Name	• 1,1,2,2-Tetrafluoroethane
Synonyms	• R134; R-134; Refrigerant 134
CAS Number	• 359-35-3
Product Code	• 90113
EC Number	• 206-628-3
Molecular Formula	• :C 2:H 2:F 4:
Molecular Weight	• 102.03

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

Relevant identified use(s)	• Semiconductor manufacture, thin film etch
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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 - CHEMTREC
Manufacturer	• +1 703-527-3887 - Outside United States

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 Skin Irritation 2 - H315 Eye Irritation 2 - H319 Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation - H335 Specific Target Organ Toxicity Single Exposure 3: Narcotic Effects - H336
DSD/DPD	• Irritant (Xi) Harmful (Xn) R36/37/38, R67

2.2 Label Elements

CLP

WARNING



- Hazard statements**
- H280 - Contains gas under pressure; may explode if heated
 - H315 - Causes skin irritation
 - H319 - Causes serious eye irritation
 - H335+H336 - May cause respiratory irritation and drowsiness or dizziness

Precautionary statements

- Prevention**
- P261 - Avoid breathing gas.
 - P264 - Wash thoroughly after handling.
 - P271 - Use only outdoors or in a well-ventilated area.
 - P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- Response**
- P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 - P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
 - P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
 - P321 - Specific treatment, see supplemental first aid information.
 - P332+P313 - If skin irritation occurs: Get medical advice/attention.
 - P362 - Take off contaminated clothing and wash before reuse.
 - P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 - P337+P313 - If eye irritation persists: Get medical advice/attention.

- Storage/Disposal**
- P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
 - P405 - Store locked up.
 - P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

DSD/DPD



- Risk phrases**
- R36/37/38 - Irritating to eyes, respiratory system and skin.
 - R67 - Vapours may cause drowsiness and dizziness.

- Safety phrases**
- S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

2.3 Other Hazards

CLP

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

DSD/DPD

- Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite. This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. 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
- Skin Irritation 2 - H315
- Eye Irritation 2A - H319

Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation - H335
Specific Target Organ Toxicity Single Exposure 3: Narcotic Effects - H336
Simple Asphyxiant
Hazards Not Otherwise Classified - Health Hazards - Frostbite

2.2 Label elements

OSHA HCS 2012

WARNING



- Hazard statements**
- Contains gas under pressure; may explode if heated - H280
 - Causes skin irritation - H315
 - Causes serious eye irritation - H319
 - May cause respiratory irritation - H335
 - May cause drowsiness or dizziness - H336
 - May displace oxygen and cause rapid suffocation.

Precautionary statements

- Prevention**
- Avoid breathing gas. - P261
 - Wash thoroughly after handling. - P264
 - Use only outdoors or in a well-ventilated area. - P271
 - Wear protective gloves/protective clothing/eye protection/face protection. - P280
- Response**
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. - P304+P340
 - Call a POISON CENTER or doctor/physician if you feel unwell. - P312
 - IF ON SKIN: Wash with plenty of soap and water. - P302+P352
 - Specific treatment, see supplemental first aid information. - P321
 - If skin irritation occurs: Get medical advice/attention. - P332+P313
 - Take off contaminated clothing and wash before reuse. - P362
 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. - P305+P351+P338
 - If eye irritation persists: Get medical advice/attention. - P337+P313
- Storage/Disposal**
- Store in a well-ventilated place. Keep container tightly closed. - P403+P233
 - Store locked up. - P405
 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations. - P501

2.3 Other hazards

OSHA HCS 2012

- Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite. 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
- Other Toxic Effects - D2B

2.2 Label elements

WHMIS

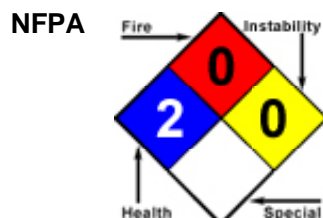


- Compressed Gas - A
- Other Toxic Effects - D2B

2.3 Other hazards

WHMIS

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

2.4 Other information**Section 3 - Composition/Information on Ingredients****3.1 Substances**

Composition				
Chemical Name	Identifiers	%	LD50/LC50	Classifications According to Regulation/Directive
Ethane, 1,1,2,2-tetrafluoro-	CAS:359-35-3 EINECS:206-628-3	99.5%	NDA	EU DSD/DPD: Self Classified: Xn, R67 Xi R36/37/38 EU CLP: Self Classified: Press. Gas - Liq., H280; Eye Irrit. 2, H319; Skin Irrit. 2, H315; STOT SE 3: Resp. Irrit., H335; STOT SE 3: Narc., H336 OSHA HCS 2012: Press. Gas - Liq.; Eye Irrit. 2A; Skin Irrit. 2; STOT SE 3: Resp. Irrit.; STOT SE 3: Narc.; HNOC - Health Hazards- Frostbite

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 CO₂.
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

- No data available

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

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. Use explosion-proof - electrical, ventilating and/or lighting equipment.

Personal Protective Equipment

Respiratory

- Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

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 liquefied gas with slight ethereal odor.
Color	Colorless	Odor	Slight ethereal odor.
Odor Threshold	Data lacking		
General Properties			
Boiling Point	-19.7 C(-3.46 F)	Melting Point	-89 C(-128.2 F)
Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	Data lacking	Water Solubility	Data lacking
Viscosity	Data lacking	Explosive Properties	Data lacking
Oxidizing Properties:	Data lacking		
Volatility			
Vapor Pressure	5.1842 atm @ 25 C(77 F)	Vapor Density	3.5 Air=1
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

- Avoid open flames and high temperatures.

10.5 Incompatible materials

- Alkali or Alkaline earth metals - powdered Al, Zn, Be, etc., molten caustics.

10.6 Hazardous decomposition products

- Decomposes with heat. Hazardous gases/vapors produced are hydrogen fluoride, and possibly carbonyl fluoride.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

1,1,2,2-Tetrafluoroethane 359-35-3								
Test Type	Dosage	Route	Species	Duration	Results	Test Class	Target Organs	Comments
Acute Toxicity	= 1500 g/m ³	Inhalation	Rat	4 Hour(s)	LC50	NDA	NDA	NDA
Reproductive	= 30 pph	Inhalation	Rat	6 Hour(s)	TCLo	NDA	NDA	NDA
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 • Skin Irritation 2 OSHA HCS 2012 • Skin Irritation 2				
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 • Specific Target Organ Toxicity Single Exposure 3: Narcotic Effects; Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation OSHA HCS 2012 • Specific Target Organ Toxicity Single Exposure 3: Narcotic Effects; Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation				
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 • Eye Irritation 2 OSHA HCS 2012 • Eye Irritation 2A				

Route(s) of entry/exposure

- Inhalation, Skin, Eye

Potential Health Effects**Inhalation****Acute (Immediate)**

- May cause respiratory irritation. May affect the central nervous system. Symptoms may include dizziness, drowsiness, lethargy, coma and death. This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. 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)**

- Causes skin irritation. Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.

Chronic (Delayed)

- No data available

Eye**Acute (Immediate)**

- Causes serious eye irritation. Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.

Chronic (Delayed)

- No data available

Ingestion**Acute (Immediate)**

- Ingestion is not anticipated to be a likely route of exposure to this product. Ingestion can cause burns similar to frostbite.

Chronic (Delayed)

- No data available

Key to abbreviations

LC = Lethal Concentration

TC = Toxic Concentration

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	UN3163	Liquefied gas, n.o.s. (1,1,2,2-Tetrafluoroethane)	2.2	NDA	NDA
TDG	UN3163	LIQUEFIED GAS, N.O.S. (1,1,2,2-Tetrafluoroethane)	2.2	NDA	NDA

IMO/IMDG	UN3163	LIQUEFIED GAS, N.O.S. (1,1,2,2-Tetrafluoroethane)	2.2	NDA	NDA
IATA/ICAO	UN3163	Liquefied gas, n.o.s. (1,1,2,2-Tetrafluoroethane)	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 MARPOL 73/78 and the IBC Code

- Not relevant.

Section 15 - Regulatory Information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****SARA Hazard Classifications** • Pressure(Sudden Release of)

State Right To Know				
Component	CAS	MA	NJ	PA
1,1,2,2-Tetrafluoroethane	359-35-3	No	No	No

Inventory						
Component	CAS	Canada DSL	Canada NDSL	China	EU EINECS	EU ELNICS
1,1,2,2-Tetrafluoroethane	359-35-3	No	Yes	Yes	Yes	No

Inventory (Con't.)		
Component	CAS	TSCA
1,1,2,2-Tetrafluoroethane	359-35-3	Yes

Canada**Labor****Canada - WHMIS - Classifications of Substances**

- 1,1,2,2-Tetrafluoroethane 359-35-3 Uncontrolled product according to WHMIS classification criteria

Canada - WHMIS - Ingredient Disclosure List

- 1,1,2,2-Tetrafluoroethane 359-35-3 Not Listed

Environment**Canada - CEPA - Priority Substances List**

- 1,1,2,2-Tetrafluoroethane 359-35-3 Not Listed

China**Environment****China - Ozone Depleting Substances - First Schedule**

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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China - Ozone Depleting Substances - Second Schedule

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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China - Ozone Depleting Substances - Third Schedule

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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Other**China - Annex I & II - Controlled Chemicals Lists**

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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China - Dangerous Goods List

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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China - Export Control List - Part I Chemicals

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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Europe**Other****EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification**

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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Germany**Environment****Germany - TA Luft - Types and Classes**

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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Germany - Water Classification (VwVwS) - Annex 1

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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Germany - Water Classification (VwVwS) - Annex 3

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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Other**Germany - Specifically Regulated Chemicals in TRGS**

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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Portugal

Other

Portugal - Prohibited Substances

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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United Kingdom

Environment

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

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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United Kingdom - Substances Contained in Dangerous Substances or Preparations

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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Other

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

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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United Kingdom - The Red List - Dangerous Substances in Water

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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United States

Labor

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

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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U.S. - OSHA - Specifically Regulated Chemicals

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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Environment

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

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
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United States - California

Environment

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

• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
U.S. - California - Proposition 65 - Developmental Toxicity		
• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)		
• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)		
• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Female		
• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Male		
• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed

United States - Pennsylvania

Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List		
• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances		
• 1,1,2,2-Tetrafluoroethane	359-35-3	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Last Revision Date	• 18/November/2013
Preparation Date	• 18/November/2013
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