



Material Safety Data Sheet

1. Product and Company Identification

Product name : **1,1-Difluoroethylene**

Chemical formula : C₂H₂F₂

Synonyms : Difluoroethene; 1,1-Difluoroethene; Ethene,1,1-Difluoro-; Ethylene,1,1-Difluoro-; Vinylidene Difluoride; Vinylidene Fluoride; Genetron 1132A; Halocarbon 1132A; UN 1959

Company : Specialty Gases of America, Inc
6055 Brent Dr.
Toledo, OH 43611

Telephone : 419-729-7732

Emergency : 800-424-9300

2. Composition/Information on Ingredients

Components	CAS Number	% Volume
1,1-Difluoroethylene	75-38-7	99+%

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following:
Fluorides.

3. Hazards Identification

Emergency Overview

Flammable gas. May cause flash fire. May polymerize. Containers may rupture or explode.
May cause difficulty breathing.

Potential Health Effects

Inhalation : Nausea, vomiting, dizziness, tingling sensation, suffocation, convulsions, coma.
Eye contact : Frostbite, blurred vision.
Skin contact : Blisters, frostbite.
Ingestion : Frostbite.
Chronic Health Hazard : No harm expected.

4. First Aid Measures

General advice : None.
Eye contact : Flush eyes with plenty of water.
Skin contact : 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 blanket. Get immediate medical attention.

- Ingestion : If a large amount is swallowed, get medical attention.
- Inhalation : If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

5. Fire-Fighting Measures

- Suitable extinguishing media : Carbon dioxide, regular dry chemical.
Large fires: Flood with fine water spray.
- Specific hazards : Severe fire hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Containers may rupture or explode if exposed to heat. Electrostatic charges may be generated by flow or agitation resulting in ignition or explosion.
- Fire fighting : Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible, then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. 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: Stop leak if possible without personal risk. Let fire burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow or material can be stopped first. Flood with fine water spray. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Evacuate if fire gets out of control or containers are directly exposed to fire. Evacuation radius: 500 meters (1/3 mile). Consider downwind evacuation if material is leaking. Stop flow of gas.

6. Accidental Release Measures

- Occupational spill/release : Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away. Isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering.
- Additional advice : None.

7. Handling and Storage

Handling

Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders. Use spark-proof tool and explosion-proof equipment.

Storage

Store in accordance with all current regulations and standards. Subject to storage regulation: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances. Store in a tightly closed container. Containers must have overpressure release device. Avoid heat, flames, sparks and other sources of ignition. Keep separated from incompatible substances.

8. Exposure Controls / Personal Protection

Exposure limits

- ACGIH : 500 ppm TWA
OSHA (final) : 2.5 mg/m³ TWA F

OSHA (vacated) : 2.5 mg/m³ TWA
 NIOSH : 1 ppm TWA
 5 ppm Ceiling

Engineering measures/Ventilation

Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

Personal protective equipment

Respiratory protection : The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
 10 ppm – Any air-purifying half-mask respirator equipped with organic vapor cartridge(s).
 Any supplied-air respirator.
 25 ppm – Any supplied-air respirator operated in a continuous-flow mode.
 Any powered, air-purifying respirator with organic vapor cartridge(s).
 50 ppm – Any air-purifying respirator with a full facepiece and an organic vapor canister.
 Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.
 Any powered, air-purifying respirator with a tight-fitting facepiece and organic vapor cartridge(s).
 Any self-contained breathing apparatus with a full facepiece.
 Any supplied-air respirator with a full facepiece.
 200 ppm – Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.
 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-face respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.
 Any appropriate escape-type, self-contained breathing apparatus.

Hand protection : Wear insulated gloves.

Eye protection : For the gas: Eye protection is not required, but recommended. For the liquid: 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 and body protection : For the gas, Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

9. Physical and Chemical Properties

Form : Gas.
 Color : Colorless.
 Odor : Faint odor, sweet odor.
 Vapor pressure : 26790 mmHg @ 21°C
 Vapor density : 2.21 @ 25°C (air = 1)
 Boiling point : -84°C
 Melting point : -144°C
 Water solubility : 0.018% @ 25°C
 Specific gravity : 2.619 (water = 1)

Evaporation rate : Not applicable.
Solvent solubility : Soluble: alcohol, ether, chloroform.

10. Stability and Reactivity

Stability : Polymerize with evolution of heat. Avoid contact with air, light, water or storage and use above room temperature. Closed containers may rupture violently.
Conditions to avoid : Avoid heat, flames, sparks or other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat.
Materials to avoid : Combustible materials, metal salts, acids, oxidizing materials, peroxides.
Hazardous decomposition products : Thermal decomposition products: halogenated compounds, oxides of carbon.

11. Toxicological Information

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

1,1-DIFLUOROETHYLENE (75-38-7) : Inhalation LC50 Rat: 240000 mg/m³/4H

Acute Toxicity Level

1,1-DIFLUOROETHYLENE (75-38-7) : Slightly toxic: Inhalation

Component Carcinogenicity

ACGIH : A4 – Not classifiable as a Human Carcinogen.

IARC : Monograph 71 [1999]; Monograph 39 [1986] (Group 3 (not classifiable))
DFG : Category 3B (could be carcinogenic for man)

Additional Data

Stimulants such as epinephrine may induce ventricular fibrillation.

12. Ecological Information

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

13. Disposal Considerations

Waste from residues / unused products : Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. D003. Dispose in accordance with all applicable regulations.
Contaminated packaging : Return cylinder to supplier.

14. Transport Information

DOT (US only)

Proper shipping name : 1,1-Difluoroethylene
Class : 2.1
UN/ID No. : UN1959
Labeling : Flammable gas

15. Regulatory Information

U.S. Federal Regulations

None of this product's components are listed under SARA Section 302/304 (40 CFR 355 Appendix A), SARA 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA 311/312

Acute: Yes
Chronic: No
Fire: Yes
Reactive: Yes
Pressure: Yes

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	RI
1,1-DIFLUOROETHYLENE	75-38-7	No	Yes	Yes	Yes	Yes	Yes

Not regulated under California Proposition 65.

16. Other Information

Prepared by : Specialty Gases of America, Inc.

For additional information, please visit our website at www.americangasgroup.com.