1. Product and Company Identification

Product name: 1,1,1,2-Tetrafluoroethane
Chemical formula: CF3CH2F
Synonyms: Ethane, 1,1,1,2-Tetrafluoro-; 1,2,2,2-Tetrafluoroethane; R 134A; Quickfreeze; E-Series(R) Freez-It(R) 2000
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

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS Number</th>
<th>% Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,2-Tetrafluoroethane</td>
<td>811-97-2</td>
<td>100%</td>
</tr>
</tbody>
</table>

3. Hazards Identification

Emergency Overview
Containers may rupture or explode if exposed to heat.

Potential Health Effects
- Inhalation: Frostbite.
- Eye contact: No information on significant adverse effects.
- Skin contact: Frostbite.
- Ingestion: No information on significant adverse effects.
- Chronic Health Hazard: None known.

4. First Aid Measures

General advice: None.
Eye contact: Flush eyes with plenty of water.
Skin contact: If frostbite occurs, flush affected area with lukewarm water.
Ingestion: If a large amount is swallowed, get medical attention.
Inhalation: Immediately remove victim to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration.
Note to physicians: For inhalation, consider oxygen.

5. Fire-Fighting Measures

Suitable extinguishing media: Carbon dioxide, regular dry chemical.
Large fires: Use regular foam or flood with fine water spray.
Specific hazards: Negligible fire hazard. Containers may rupture or explode if exposed to heat.

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. 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. Cool containers with water spray until well after the fire is out. 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.

6. Accidental Release Measures

Occupational spill/release: Stop leak if possible without personal risk. Keep unnecessary people away. Isolate hazard area and deny entry. Stay upwind and keep out of low areas.

Additional advice: None.

7. Handling and Storage

Handling: Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders.

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. Avoid contact with light. Store below 49°C. Do not puncture or burn containers, even when empty. Shelf life is 1 year.

8. Exposure Controls / Personal Protection

Exposure limits
1000 ppm TWA

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: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. Any supplied-air respirator with a full-facepiece that is operated in a pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. For unknown concentrations or immediately dangerous to life or health – 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. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

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 : Wear appropriate chemical resistant clothing.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Gas</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Sweet odor</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>4963 mmHg @ 25°C</td>
</tr>
<tr>
<td>Vapor density</td>
<td>3.18 (air = 1)</td>
</tr>
<tr>
<td>Boiling point</td>
<td>-27°C</td>
</tr>
<tr>
<td>Melting point</td>
<td>Not available</td>
</tr>
<tr>
<td>Water solubility</td>
<td>0.15% @ 25°C</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>Not available</td>
</tr>
</tbody>
</table>

10. Stability and Reactivity

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Stable under normal conditions.</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.</td>
</tr>
<tr>
<td>Materials to avoid</td>
<td>Metals, oxidizing materials.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Thermal decomposition products: halogenated compounds, oxides of carbon.</td>
</tr>
</tbody>
</table>

11. Toxicological Information

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

1,1,1,2-TETRAFLUOROETHANE (811-97-2) : Inhalation LC50 Rat: 1500 g/m3/4H

Component Carcinogenicity

None of this product’s components are listed by ACGIH, IARC, NTP, OSHA or DFG.

Medical Conditions Aggravated by Exposure

Heart or cardiovascular disorders, heart problems, immune system disorders or allergies, respiratory disorders, skin disorders and allergies.

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

<table>
<thead>
<tr>
<th>Waste/Unused Contaminated Packaging</th>
<th>Disposal Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste from residues / unused products</td>
<td>Dispose in accordance with all applicable regulations.</td>
</tr>
<tr>
<td>Contaminated packaging</td>
<td>Return cylinder to supplier.</td>
</tr>
</tbody>
</table>
14. Transport Information

DOT (US only)
Proper shipping name: Compressed gas, n.o.s. (Contains: 1,1,1,2-Tetrafluoroethane)
Class: 2.2
UN/ID No.: UN1956
Labeling: Nonflammable gas

15. Regulatory Information

U.S. Federal Regulations
This material contains one of more of the following chemicals required to be identified under SARA Section 302/304 (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.

1,1,1,2-TETRAFLUOROETHANE (811-97-2) : TSCA 12b: Section 5, 1%

SARA 311/312
Acute: No
Chronic: No
Fire: No
Reactive: No
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
--- | --- | --- | --- | --- | --- | --- | ---
1,1,1,2-TETRAFLUOROETHANE | 811-97-2 | No | No | Yes | No | No | No

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.