

# Material Safety Data Sheet



Halocarbon 134a (1,1,1,2-Tetrafluoroethane)

## Section 1. Chemical product and company identification

|                                          |                                                                                                                                             |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product name</b>                      | : Halocarbon 134a (1,1,1,2-Tetrafluoroethane)                                                                                               |
| <b>Supplier</b>                          | : AIRGAS INC., on behalf of its subsidiaries<br>259 North Radnor-Chester Road<br>Suite 100<br>Radnor, PA 19087-5283<br>1-610-687-5253       |
| <b>Product use</b>                       | : Synthetic/Analytical chemistry.Refrigeration.                                                                                             |
| <b>Synonym</b>                           | : 1,1,1,2-Tetrafluoroethane; Ethane, 1,1,1,2-tetrafluoro-; 1,1,1,2-Tetrafluoroethane (Refrigerant gas R134A); HFC 134a; HCF 134a; HCFC-134a |
| <b>MSDS #</b>                            | : 001055                                                                                                                                    |
| <b>Date of Preparation/<br/>Revision</b> | : <b>3/12/2014.</b>                                                                                                                         |
| <b>In case of emergency</b>              | : 1-866-734-3438                                                                                                                            |

## Section 2. Hazards identification

|                                                       |                                                                                                                                                                                         |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Physical state</b>                                 | : Gas. [Liquefied gas]                                                                                                                                                                  |
| <b>Emergency overview</b>                             | : WARNING!<br>MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.<br>May cause target organ damage, based on animal data.<br>Contact with rapidly expanding gases can cause frostbite. |
| <b>Target organs</b>                                  | : May cause damage to the following organs: central nervous system (CNS).                                                                                                               |
| <b>Routes of entry</b>                                | : Inhalation                                                                                                                                                                            |
| <b>Potential acute health effects</b>                 |                                                                                                                                                                                         |
| <b>Eyes</b>                                           | : Liquid can cause burns similar to frostbite.                                                                                                                                          |
| <b>Skin</b>                                           | : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.                                                                                  |
| <b>Inhalation</b>                                     | : Acts as a simple asphyxiant.                                                                                                                                                          |
| <b>Ingestion</b>                                      | : Ingestion is not a normal route of exposure for gases                                                                                                                                 |
| <b>Potential chronic health effects</b>               |                                                                                                                                                                                         |
| <b>Chronic effects</b>                                | : May cause target organ damage, based on animal data.                                                                                                                                  |
| <b>Target organs</b>                                  | : May cause damage to the following organs: central nervous system (CNS).                                                                                                               |
| <b>Medical conditions aggravated by over-exposure</b> | : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.                                        |

See toxicological information (Section 11)

## Section 3. Composition, Information on Ingredients

| <b>Name</b>                                 | <b>CAS number</b> | <b>% Volume</b> | <b>Exposure limits</b>                                        |
|---------------------------------------------|-------------------|-----------------|---------------------------------------------------------------|
| Halocarbon 134a (1,1,1,2-Tetrafluoroethane) | 811-97-2          | 100             | AIHA WEEL (United States, 10/2011).<br>TWA: 1000 ppm 8 hours. |

## Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact with liquid, warm frozen tissues slowly with lukewarm water. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : As this product rapidly becomes a gas when released, refer to the inhalation section.

## Section 5. Fire-fighting measures

- Flammability of the product** : Non-flammable.
- Products of combustion** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
halogenated compounds
- Fire-fighting media and instructions** : Use an extinguishing agent suitable for the surrounding fire.
- Apply water from a safe distance to cool container and protect surrounding area. If involved in fire, shut off flow immediately if it can be done without risk.
- Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

## Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.
- Environmental precautions** :
- Methods for cleaning up** : Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

- Handling** : High pressure gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty.
- Storage** : Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8. Exposure controls/personal protection

- Engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

### Personal protection

## Halocarbon 134a (1,1,1,2-Tetrafluoroethane)

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Personal protection in case of a large spill** : Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product.

### Product name

norflurane

AIHA WEEL (United States, 10/2011).

TWA: 1000 ppm 8 hours.

Consult local authorities for acceptable exposure limits.

## Section 9. Physical and chemical properties

|                                            |                                                |
|--------------------------------------------|------------------------------------------------|
| <b>Molecular weight</b>                    | : 102.04 g/mole                                |
| <b>Molecular formula</b>                   | : C <sub>2</sub> H <sub>2</sub> F <sub>4</sub> |
| <b>Boiling/condensation point</b>          | : -26°C (-14.8°F)                              |
| <b>Melting/freezing point</b>              | : -108°C (-162.4°F)                            |
| <b>Critical temperature</b>                | : 100.9°C (213.6°F)                            |
| <b>Vapor pressure</b>                      | : 81.3 (psig)                                  |
| <b>Vapor density</b>                       | : 3.5 (Air = 1)                                |
| <b>Specific Volume (ft<sup>3</sup>/lb)</b> | : 3.7078                                       |
| <b>Gas Density (lb/ft<sup>3</sup>)</b>     | : 0.2697 (25°C / 77 to °F)                     |

## Section 10. Stability and reactivity

|                                         |                                                                                                        |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>Stability and reactivity</b>         | : The product is stable.                                                                               |
| <b>Hazardous decomposition products</b> | : Under normal conditions of storage and use, hazardous decomposition products should not be produced. |
| <b>Hazardous polymerization</b>         | : Under normal conditions of storage and use, hazardous polymerization will not occur.                 |

## Section 11. Toxicological information

### Toxicity data

| Product/ingredient name | Result                | Species | Dose                  | Exposure |
|-------------------------|-----------------------|---------|-----------------------|----------|
| norflurane              | LC50 Inhalation Vapor | Rat     | 1500 g/m <sup>3</sup> | 4 hours  |

**Chronic effects on humans** : May cause damage to the following organs: central nervous system (CNS).

**Other toxic effects on humans** : No specific information is available in our database regarding the other toxic effects of this material to humans.

### Specific effects

**Halocarbon 134a (1,1,1,2-Tetrafluoroethane)**

**Carcinogenic effects** : No known significant effects or critical hazards.  
**Mutagenic effects** : No known significant effects or critical hazards.  
**Reproduction toxicity** : No known significant effects or critical hazards.

**Section 12. Ecological information****Aquatic ecotoxicity**

Not available.

**Environmental fate** : Not available.  
**Environmental hazards** : This product shows a low bioaccumulation potential.  
**Toxicity to the environment** : Not available.

**Section 13. Disposal considerations**

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

**Section 14. Transport information**

| Regulatory information       | UN number | Proper shipping name                                 | Class | Packing group         | Label                                                                                 | Additional information                                                                                                                                                                                                             |
|------------------------------|-----------|------------------------------------------------------|-------|-----------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DOT Classification</b>    | UN3159    | 1,1,1,2-TETRAFLUOROETHANE OR REFRIGERANT GAS R 134A  | 2.2   | Not applicable (gas). |    | <b>Limited quantity</b><br>Yes.<br><br><b>Packaging instruction</b><br><b>Passenger aircraft</b><br>Quantity limitation: 75 kg<br><br><b>Cargo aircraft</b><br>Quantity limitation: 150 kg<br><br><b>Special provisions</b><br>T50 |
| <b>TDG Classification</b>    | UN3159    | REFRIGERANT GAS R 134A; OR 1,1,1,2-TETRAFLUOROETHANE | 2.2   | Not applicable (gas). |  | <b>Explosive Limit and Limited Quantity Index</b><br>0.125<br><br><b>Passenger Carrying Road or Rail Index</b><br>75                                                                                                               |
| <b>Mexico Classification</b> | UN3159    | 1,1,1,2-TETRAFLUOROETHANE OR REFRIGERANT GAS R 134A  | 2.2   | Not applicable (gas). |  | -                                                                                                                                                                                                                                  |

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

## Section 15. Regulatory information

### United States

**U.S. Federal regulations** : TSCA 8(a) CDR Exempt/Partial exemption: Not determined  
 United States inventory (TSCA 8b): This material is listed or exempted.  
 SARA 302/304: No products were found.  
 SARA 311/312 Hazards identification: Sudden release of pressure, Delayed (chronic) health hazard

### State regulations

: **Connecticut Carcinogen Reporting**: This material is not listed.  
**Connecticut Hazardous Material Survey**: This material is not listed.  
**Florida substances**: This material is not listed.  
**Illinois Chemical Safety Act**: This material is not listed.  
**Illinois Toxic Substances Disclosure to Employee Act**: This material is not listed.  
**Louisiana Reporting**: This material is not listed.  
**Louisiana Spill**: This material is not listed.  
**Massachusetts Spill**: This material is not listed.  
**Massachusetts Substances**: This material is not listed.  
**Michigan Critical Material**: This material is not listed.  
**Minnesota Hazardous Substances**: This material is not listed.  
**New Jersey Hazardous Substances**: This material is not listed.  
**New Jersey Spill**: This material is not listed.  
**New Jersey Toxic Catastrophe Prevention Act**: This material is not listed.  
**New York Acutely Hazardous Substances**: This material is not listed.  
**New York Toxic Chemical Release Reporting**: This material is not listed.  
**Pennsylvania RTK Hazardous Substances**: This material is not listed.  
**Rhode Island Hazardous Substances**: This material is not listed.

### Canada

#### WHMIS (Canada)

: Class A: Compressed gas.  
**CEPA Toxic substances**: This material is listed.  
**Canadian ARET**: This material is not listed.  
**Canadian NPRI**: This material is listed.  
**Alberta Designated Substances**: This material is not listed.  
**Ontario Designated Substances**: This material is not listed.  
**Quebec Designated Substances**: This material is not listed.

## Section 16. Other information

### United States

**Label requirements** : MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

### Canada

**Label requirements** : Class A: Compressed gas.

### Hazardous Material Information System (U.S.A.)

|                  |   |
|------------------|---|
| Health           | 1 |
| Flammability     | 1 |
| Physical hazards | 0 |
|                  |   |

**Halocarbon 134a (1,1,1,2-Tetrafluoroethane)**

National Fire Protection :  
Association (U.S.A.)



**Notice to reader**

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.