

## 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product Identifier

Identification of the substance

Trade name: R-134A (1,1,1,2-Tetrafluoroethane)  
Trade code: R-134a  
Product type and use: Refrigerant, non-flammable aerosol propellant and blowing agent.  
CAS number: 811-97-2  
EC number: 212-377-0  
REACH No. 01-2119459374-33-xxxx

### 1.2. Relevant identified uses of the substance/mixture and uses advised against

Recommended use:

Refrigerant, non-flammable aerosol propellant and blowing agent.

### 1.3. Details of the supplier of the safety data sheet

Company:

Gases: Research Innovation & Technology SL.

C/ Balmes, 66 08007 BARCELONA

Tel: 93/272.14.00

Fax: 93/215.38.08

Competent person responsible for the safety data sheet:

vmanzano@grit.es

### 1.4. Emergency telephone number

+34 630215 910 (24h)

## 2. HAZARDS IDENTIFICATION


### 2.1. Classification of the substance or mixture

Directive criteria, 67/548/CE, 99/45/EC and following amendments thereof:

Properties / Symbols:

None.

EC regulation criteria 1272/2008 (CLP):

 Warning, Liquef. Gas, Contains gas under pressure

Adverse physicochemical, human health and environmental effects:

No other hazards

### 2.2. Label elements

Symbols:



Warning

Hazard statements:

H280 Contains gas under pressure; may explode if heated.

Precautionary statements:

P410+P403 Protect from sunlight. Store in a well-ventilated place.

Special Provisions:

None

The preparation should not be considered as dangerous accordingly to dir. 1999/45/EC.

2.3. Other hazards

vPvB Substances: None - PBT Substances: None

Other Hazards:

No other hazards

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### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical characterization: R-134A (1,1,1,2-Tetrafluoroethane)

3.1. Substances

Identification of the substance

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Trade code: R-134a

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3.2. Mixtures

None.

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### 4. FIRST AID MEASURES

4.1. Description of first aid measures

In case of skin contact:

Wash frost-bitten areas with plenty of water. Do not remove clothing. Cover wound with sterile dressing.

In case of eyes contact:

Wash immediately and thoroughly with running water, keeping eyelids raised, for at least 10 minutes. Following this, protect the eyes with sterile gauze or a clean, dry, handkerchief.

OBTAIN A MEDICAL EXAMINATION.

In case of Ingestion:

Ingestion is not considered a potential route of exposure.

In case of Inhalation:

Move to fresh air. If breathing has stopped or is labored, give assisted respirations.

Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen.

Remove casualty to fresh air and keep warm and at rest.

4.2. Most important symptoms and effects, both acute and delayed

None

4.3. Indication of any immediate medical attention and special treatment needed

Treatment:

No data available.

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### 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media:

Water.

Carbon dioxide (CO<sub>2</sub>).

Extinguishing media which must not be used for safety reasons:

None in particular.

5.2. Special hazards arising from the substance or mixture

Do not inhale explosion and combustion gases.

5.3. Advice for fire-fighters

Use suitable breathing apparatus .  
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.  
Move undamaged containers from immediate hazard area if it can be done safely.

## 6. ACCIDENTAL RELEASE MEASURES

- 6.1. Personal precautions, protective equipment and emergency procedures
  - Wear personal protection equipment.
  - Remove persons to safety.
  - See protective measures under point 7 and 8.
- 6.2. Environmental precautions
  - Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.
  - Retain contaminated washing water and dispose it.
  - In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.
  - Suitable material for taking up: absorbing material, organic, sand
- 6.3. Methods and material for containment and cleaning up
  - Wash with plenty of water.
- 6.4. Reference to other sections
  - See also section 8 and 13

## 7. HANDLING AND STORAGE

- 7.1. Precautions for safe handling
  - Only experienced and properly instructed persons should handle liquefied gases liquids.
  - Protect packages from physical damage; do not drag, roll, slide or drop.
  - Avoid contact with skin and eyes, inhalation of vapours and mists.
  - Do not eat or drink while working.
  - See also section 8 for recommended protective equipment.
- 7.2. Conditions for safe storage, including any incompatibilities
  - Keep away from food, drink and feed.
  - Incompatible materials:
    - None in particular.
  - Instructions as regards storage premises:
    - Adequately ventilated premises.
- 7.3. Specific end use(s)
  - None in particular

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

- 8.1. Control parameters
  - None.
- 8.2. Exposure controls
  - Eye protection:
    - Safety glasses recommended when handling packages
  - Protection for skin:
    - Safety shoes are recommended when handling packages
  - Protection for hands:
    - Sturdy work gloves are recommended for handling packages.
  - Respiratory protection:
    - Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere.
    - Air purifying respirators will not provide protection. Users of breathing apparatus must be trained.
  - Thermal Hazards:
    - Use gloves thermos insulating
  - Environmental exposure controls:

Ensure adequate ventilation, especially in confined areas.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties

Appearance and colour:	Liquefied, colorless gas
Odour:	Ether like.
Odour threshold:	N.A.
Melting point / freezing point:	-108°C
Initial boiling point and boiling range:	-26°C
Solid/gas flammability:	N.A.
Upper/lower flammability or explosive limits:	Not applicable
Flash point:	gas no inflamable ° C
Evaporation rate:	N.A.
Vapour pressure:	5740 hPa ( 25°C)
Liquid density:	1,225 Kg/l (20°C)
Gas density:	27,78 Kg/m <sup>3</sup> (20°C)
Solubility in water:	0.15%.
Lipid solubility:	N.A.
Partition coefficient (n-octanol/water):	1,06 (25°C)
Auto-ignition temperature:	743°C
Decomposition temperature:	N.A.
Viscosity:	0,21 mPa.S
Explosive properties:	N.A.
Oxidizing properties:	N.A.

### 9.2. Other information

Miscibility:	N.A.
Fat Solubility:	N.A.
Conductivity:	N.A.
Substance Groups relevant properties	N.A.
Critical temperature:	101,1°C
Critical pressure :	40,6 bar

## 10. STABILITY AND REACTIVITY

### 10.1. Reactivity

Stable under normal conditions

### 10.2. Chemical stability

Stable under normal conditions

### 10.3. Possibility of hazardous reactions

Thermal decomposition yields toxic products that can be corrosive in the presence of moisture.

### 10.4. Conditions to avoid

Alkali and alkaline earth metals - powdered aluminum, zinc, etc.

### 10.5. Incompatible materials

None in particular.

### 10.6. Hazardous decomposition products

Hydrofluoric acid  
Fluorine phosgene

## 11. TOXICOLOGICAL INFORMATION

### 11.1. Information on toxicological effects

R-134A (1,1,1,2-Tetrafluoroethane) - CAS: 811-97-2

Acute oral toxicity:

Ingestion is not considered a potential route of exposure.

Inhalation:

Inhalation of high concentrations may also cause mild central nervous system depression and heartbeat irregularities. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves.

Acute dermal toxicity:

Contact with liquid may cause cold burns/frostbite.

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## 12. ECOLOGICAL INFORMATION

### 12.1. Toxicity

Adopt good working practices, so that the product is not released into the environment.

### 12.2. Persistence and degradability

None

### 12.3. Bioaccumulative potential

Air, fotolisis, ODP = 0.

Result: absence of effect on the stratospheric ozone.

Reference CFC 11: ODP = 1.

Air, effect of greenhouse, GWP ca. 1300.

(Global Warning Potencial)

### 12.4. Mobility in soil

Henry's constant (H) ca. 10220 kPa.m<sup>3</sup>/mol

Conditions: 25°C / calculated value

### 12.5. Results of PBT and vPvB assessment

vPvB Substances: None - PBT Substances: None

### 12.6. Other adverse effects

None

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## 13. DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

Recover if possible. In so doing, comply with the local and national regulations currently in force.

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## 14. TRANSPORT INFORMATION

### 14.1. UN number

ADR-UN number: 3159

IATA-Un number: 3159

IMDG-Un number: 3159

### 14.2. UN proper shipping name

ADR-Shipping Name: UN 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)

IATA-Technical name: UN 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)

IMDG-Technical name: UN 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)

### 14.3. Transport hazard class(es)

ADR-Class: 2

ADR-Label: 2.2

ADR-Upper number: 20

IATA-Class: 2.2

IATA-Label: 2.2

IMDG-Class: 2.2

IMDG-Label: 2.2

14.4. Packing Group

14.5 Environmental hazards

Marine pollutant: No

14.6. Special Precautions for User

ADR-Tunnel Restriction Code: (C/E)

Rail (RID): 3159

IMDG-Technical name: UN 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)

IMDG-EMS: F-C, S-V

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

N.A.

## 15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture Dir. 67/548/EEC (Classification, packaging and labelling of dangerous substances). Dir. 99/45/EEC (Classification, packaging and labelling of dangerous preparations). Dir. 98/24/EC (Risks related to chemical agents at work). Dir. 2000/39/EC (Occupational exposure limit values); Dir. 2006/8/CE. Regulation (CE) n. 1907/2006 (REACH), Regulation (CE) n.1272/2008 (CLP), Regulation (CE) n.790/2009.

Where applicable, refer to the following regulatory provisions :

Directive 82/501/EEC ('Activities linked to risks of serious accidents') and subsequent amendments.

Regulation (EC) nr 648/2004 (detergents).

1999/13/EC (VOC directive)

15.2. Chemical Safety Assessment

No

## 16. OTHER INFORMATION

This document was prepared by a competent person who has received appropriate training.

Main bibliographic sources:

ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre, Commission of the European Communities

SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van Nostrand Reinold

CCNL - Appendix 1

Insert further consulted bibliography

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

This MSDS cancels and replaces any preceding release.