

Safety Data Sheet

Product : 1,1,1,2-Tetrafluoroethane, R134a

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MSDS Nr : 300-00-0045BOC(A)

Version : 1.02

Date : 05/08/2003

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

Product name 1,1,1,2-Tetrafluoroethane, R134a
Company identification see heading and/or footer
Emergency phone numbers see heading and/or footer

2 COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation Substance.
Components/Impurities Contains no other components or impurities which will influence the classification of the product.
CAS Nr 811-97-2
EC Nr (from EINECS) 212-377-0

3 HAZARDS IDENTIFICATION

Hazards identification In high concentrations may cause asphyxiation.
Liquefied gas
Not classified as dangerous substance.

4 FIRST AID MEASURES

Inhalation In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.
In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
Skin/eye contact In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing.
Immediately flush eyes thoroughly with water for at least 15 minutes.
Obtain medical assistance
Ingestion Ingestion is not considered a potential route of exposure.

5 FIRE FIGHTING MEASURES

Specific hazards Exposure to fire may cause containers to rupture/explode.
Non flammable
Hazardous combustion products If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition:
Carbonyl fluoride

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| | Hydrogen fluoride |
| | Carbon monoxide |
| Suitable extinguishing media | All known extinguishants can be used. |
| Specific methods | If possible, stop flow of product. |
| | Move away from the container and cool with water from a protected position. |
| Special protective equipment for fire fighters | Use self-contained breathing apparatus and chemically protective clothing. |

6 ACCIDENTAL RELEASE MEASURES

| | |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Personal precautions | Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. |
| Environmental precautions | Try to stop release. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. |
| Clean up methods | Ventilate area. |

7 HANDLING AND STORAGE

| | |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Handling and storage | Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Refer to supplier's container handling instructions. Keep container below 50°C in a well ventilated place. |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

| | |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Exposure limit value for country | UK: 1,1,1,2-Tetrafluoroethane (R134a) - LTEL: 1000ppm (EH40/2002) |
| Personal protection | Ensure adequate ventilation. Do not smoke while handling product. Protect eyes, face and skin from liquid splashes. |

9 PHYSICAL AND CHEMICAL PROPERTIES

| | |
|------------------|----------|
| Molecular weight | 102 |
| Melting point | -101 °C |
| Boiling point | -26.5 °C |

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| Relative density, gas | 3.5 (air=1) |
| Relative density, liquid | 1.2 (water=1) |
| Vapour Pressure 20°C | 4.7 bar |
| Solubility mg/l water | 1.5 g/l at 25°C |
| Appearance/Colour | Colourless gas |
| Odour | Ethereal |
| | Poor warning properties at low concentrations. |
| Other data | Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level. |

10 STABILITY AND REACTIVITY

| | |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stability and reactivity | Stable under normal conditions. Thermal decomposition yields toxic products which can be corrosive in the presence of moisture. May react with aluminium. |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|

11 TOXICOLOGICAL INFORMATION

| | |
|---------|--------------------------------------------------------|
| General | May produce irregular heart beat and nervous symptoms. |
|---------|--------------------------------------------------------|

12 ECOLOGICAL INFORMATION

| | |
|-----------------------|------------------------------------------------------------------------------|
| General | When discharged in large quantities may contribute to the greenhouse effect. |
| Global warming factor | 1300 (CO ₂ =1) |

13 DISPOSAL CONSIDERATIONS

| | |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General | Avoid discharge to atmosphere. Do not discharge into any place where its accumulation could be dangerous. Refer to supplier's waste gas recovery programme. Contact supplier if guidance is required. |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

14 TRANSPORT INFORMATION

| | |
|-----------------------------|---------------------------|
| Proper shipping name | 1,1,1,2-Tetrafluoroethane |
| UN Nr | 3159 |
| Class | 2 |
| ADR/RID Classification code | 2A |

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| ADR/RID Hazard Nr | 20 |
| Labelling ADR | Label 2.2: non flammable non toxic gas |
| Other transport information | Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured and: - cylinder valve is closed and not leaking - valve outlet cap nut or plug (where provided) is correctly fitted - valve protection device (where provided) is correctly fitted - there is adequate ventilation. - compliance with applicable regulations. |

15 REGULATORY INFORMATION

| | |
|---------------------------------|------------------------------------------|
| Number in Annex I of Dir 67/548 | Not applicable for preparations |
| EC Classification | Not classified as dangerous preparation. |
| Labelling of cylinders | |
| -Symbols | Label 2.2: non flammable non toxic gas |

16 OTHER INFORMATION

Ensure all national/local regulations are observed.
Contact with liquid may cause cold burns/frost bite.
Asphyxiant in high concentrations.
Keep container in well ventilated place.
Do not breathe the gas.
The hazard of asphyxiation is often overlooked and must be stressed during operator training.
Users of breathing apparatus must be trained.

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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