FORWARD MATERIAL CO., LTD
Add: Hi-tech Industrial Area, Yumin Road, Zibo City, Shandong Province,, China
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Material Safety Data Sheet R134a

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: 1,1,1,2-TETRAFLUOROETHANE
Company: FORWARD MATERIAL CO., LTD.
Street Address: Hi-tech Industrial Area, Yumin Road, Zibo City, Shandong Province, China, 255000
Chem-tract: +86-533-8222579
MEDICAL: +86-533-8222259

2. Composition/Information on Ingredient

Substance Name	CAS Registry Number
1,1,1,2-TETRAFLUOROETHANE	811-97-2

Formula: CH_2-F-CF_3

3. Hazards Identification

Main Hazards All cylinders are portable gas containers, and must be regarded as pressure vessels at all times. R134a does not support life. It can act as a simple asphyxiant by diluting the concentration of oxygen in air to below the levels necessary to support life.

Adverse Health effects: The inhalation of high concentrations of R134a vapor may cause temporary central nervous system depression, with narcosis, lethargy and anaesthetic effects. Continued breathing of high concentrations of R134a vapors may producecardiac irregularities, unconsciousness and death.

Chemical hazards R134a vapors decompose when exposed to high temperatures with the formation of toxic and irritating compounds such as hydrofluoric acid, carbon monoxide and carbonyl fluoride.

Biological hazards Contact with the liquid phase could cause freeze burns.

Vapor inhalation: Inhalation of small amounts of R134a vapor does not damage the respiratory organs.

4, FIRST AID MEASURES

Prompt medical attention is mandatory in all cases of overexposure to vaporized R134a. Rescue personal should be equipped with self-contained breathing apparatus. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated

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area is most important. Unconscious persons should be removed to an uncontaminated area and given mouth-to-mouth resuscitation and supplemental oxygen. The use of adrenaline or similar drugs should be avoided.

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician

Ingestion: Provided the patient is conscious, wash out the mouth with water,and give 200=-300 ml to drink. Obtain immediate medical attention.

Skin contact

Vapor No known effect

Liquid In case of frosbite from contact with liquid R134a, place the frost-bitten part in warm water, about 40-43℃. If warm water is not available, or is impractical to use, wrap the effected part gently in blankets. Encourage the patient to exercise the affected part whilst it is being warmed. Do not remove clothing while frosted. Call a physician.

EYE EXPOSUR

Vapor No known effect

Liquid In case of contact with eyes, immediately flush with large quantities of tepid water, or with sterile solution. Call a physician.

5, Fire Fighting Measure

FLASH POINT N/A

AUTOIGNITION TEMP N/A

FLAMMABILITY N/A

Extinguishing As R134a is non-flammable, it will not

Media: Contribute to the fire, but could help with the oxygen content of the air by dilution to reduce the level to support combustion

Specific hazards R134a does not support life. It can act as a simple asphyxiant by diluting the concentration of oxygen in the air below the levels to support life.

Emergency actions If possible, shut off the source of excess R134a Evacuate area. All cylinders should be removed from the vicinity of the fire. Cylinders that can not be removed should be cooled with water from a safe distance. Cylinders which have been exposed to excessive heat should be clearly identified and returned to the supplier.

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazards: Emits toxic fumes under fire conditions

Precautions In low-lying areas. Care should be taken when entering a potentially oxygen-deficient environment. If possible, ventilate the affected area.

6, ACCIDENTAL RELEASE MEASURES

Personal Precautions Do not enter any areas where R134a has been spilled unless tests have shown that it is safe to do so.

Environmental R134a does not pose a hazard to environment.

7, Handling and Storage

Do not allow cylinders to slide or come into contact with sharp edges. R134a cylinders should be

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stacked vertically at all times, and should be firmly secured in order to prevent them from being knocked over. Keep out of reach of children.

8, EXPOSURE CONTROLS

ENGINEERING CONTROLS

Engineering control measures are preferred to reduce oxygen depleted atmospheres. General methods includes forced-draught ventilation, separate from other oxhaust ventilation systems. Ensure that sufficient fresh air enters at, or near , floor level.

PERSONAL PROTECTIVE EQUIPMENT

Self-contained breathing apparatus should always be worn when entering area where oxygen depletion may have occurred. Safety goggles, gloves and shoes or boots should be worn when handling cylinders.

9, PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Chemical symbol	$CH_2F\text{-}CF_3$
Molecular Weight	102.03
Boiling point @101.325 kPa	- 26.18℃
Density(staturated vapor) at boiling point	5.26kg/m^3
Auto-ignition temperature	770℃
Ozone depletion potential	0
Halocarbon global warming potential	1300
Color	Colorless
Taste	Not applicable
Odor	Slightly ethereal

10, STABILITY AND REACTIVITY

Conditions to avoid The dilution of oxygen concentration in the atmosphere to levels which can not support life. Never use cylinders as rollers or supports, or for any other purpose than the storing of R134a. Never expose the cylinders to excessive heat, as this may cause sufficient build-up of pressure to rupture the cylinders

Incompatible materials Since the performance of plastic materials is affected by polymer variations, compounding agents fillers, and moulding processes, verify compatibility using actual fabricated parts under end-use conditions is nadvised. The effects on specific elastomers depend on the nature of the polymer, the compounding formulation used and the curing of vulcanizing conditions, Actual samples should be tested under end-use conditions before specifying elastomers for critical componments

Hazardous Decomposition Produce R134a vapors will decompose out when exposed to high temperatures from flames or electric resistance heaters. Decomposition may produce toxic and irritating compounds, such as hydrogen fluoride.

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11, TOXICOLOGICAL INFORMATION

Acute Toxicity (TWA8+12hr) 1000ppm

Skin and eye contact	No known effect
Chronic Toxicity	No known effect
Carcinogenicity	No Known effect
Mutagenicity	No known effect
Reproductive Hazards	No known effect

12, ECOLOGICAL INFORMATION

As R134a has an Ozone Depletion Potential(ODP) of 0, as well as a very low satiability in water, it does not pose a hazard to the ecology.

13, Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Disposal refers to the destruction R134a, and may be necessary when R134a has become badly contaminated with other products, and no longer meets the accepted specification. All badly contaminated products should be sent to qualified waste disposal firms for further treatment.

14, Transport Information

Proper Shipping Name: 1,1,1,2-TETRAFLUOROETHANE
UN Number:3159
CLASS: 2.2
LABEL: Non-flammable gas

15 Regulatory Information

Hazard class: Non flammable gas

Safety phrases
- Keep out of reach of children
- Keep container in a well-ventilated place
- Keep away from heat
- When using do not smoke
- Wear suitable protective clothing
- In case of fire/explosion do not breathe fumes.
- Use only in well ventilated areas
- Do not discharge into the environment.
- Dispose to an authorized waste collection point.

National legislation None

16, OTHER INFORMATON

Revision Information

Revision Date	15 JUN 2003
Revision Date	18 May,2006

The End of MSDS