



ZHEJIANG QUHUA FLUOR-CHEMISTRY CO., LTD

MSDS

Chemical safety data sheet of 1,1,1,2-tetrafluoroethane

Part 1 Chemical and Enterprise Logo

Name: R-134a or HFC-134a

Chemical name: 1,1,1,2-tetrafluoroethane

Enterprise name: ZHEJIANG QUHUA FLUOR-CHEMISTRY CO., LTD

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Code of chemical safety data sheet: CSDS/FH 14-2004

Effective date: 1 January 2010

National emergency telephone: 0532-3889090; 0532-3889191

Part 2 Component/ingredient Information

Purity or mixture: purity

Name of chemical: 1,1,1,2-tetrafluoroethane

Hazardous element	content	CAS No:
1,1,1,2-tetrafluoroethane	99.9%	811-97-2

Part 3 Description of hazard

Risk category: 2.2 category inflammable gas

Route of entry: inhalation, ingestion, eye and skin contact

Health hazard: When the concentration is high, the pressure of oxygen in the air will fall, lead to anoxic suffocation. When eye or skin contact with this liquid product, it will cause damage such as frostbite. Under the thermal condition, this product will be decomposed, produce HF and carbon-fluorine-oxygen compound, like virulent carbonyl fluoride ($\text{F}_2\text{C}=\text{O}$).

Environmental hazards: ODP value: 0, GWP value: 1200

Flaming and explosive hazards: Under normal condition, this product is non-flammable, but under special condition, it is flammable.

Part 4 Emergency Measure

Skin contact: Take off the contaminated cloth, use soapsuds and clean water to fully wash skin for at least 15 minutes. If frostbite, seek medical treatment.

Eye contact: Hold up eyelid, use running clean water or physiological saline solution wash the eye, after that, seek medical treatment.



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Inhalation contact: Leave working area, evacuate to fresh air immediately. Keep respiratory tract open. If breathing is difficult, execute oxygen therapy. If heartbeat or breathing stops, execute artificial respiration, seek medical treatment.

Digestive contact: Drink enough warm water, forced vomit, after that, seek medical treatment.

Part 5 Fire fighting measure

Hazard property: This product does not burn or explode in the air. If in high temperature, it will decomposed, release poisonous HF and carbon-fluorine-oxygen compound. When heated, the pressure in the container increase with possibility of rupture or explosion

Hazardous product of combustion: Poisonous HF and carbon-fluorine-oxygen compound.

Extinguishing method: This product itself is not flammable. Cut off gas resource. Spill water to cool off container, if possible remove container to open place.

Recommended extinguishing agent: Foggy water, foam, carbon dioxide

Attention and measure: Wear protective clothes and self-contained positive pressure ventilator, extinguish fire at upwind place.

Part 6 Anti-leak Emergency Management

Emergency treatment method: Evacuate person from contaminated area to fresh air, quarantine, strict on access. It is suggested that emergency personnel wear positive self-contained breathing apparatus and protective clothes. Cut off the source of leakage, remove the leaked container to ventilated area. The leaked container should be carefully handled and repaired, reuse after testing.

Elimination: Properly ventilated, accelerate proliferation. If possible, execute immediately

Part 7 Handling and storage

Handling: Operate in enclose area with sufficient ventilation. Operators should be specially trained, and rigorously observe the regulation of operation procedure. If the concentration exceeds the standard, operator should wear self-contained breathing apparatus protective goggle to prevent gas leak to the air.. When pack or unpack this product, pay attention not to damage cylinder and accessories which should be outfitted with anti-leak emergency management equipment.

Store: This product should be kept in cool and ventilated place. Keep away from fire or heat resource. The temperature in the storage should not surpass 30°C, avoid direct sunshine, store separately from oxide, flammable substance and food chemical, pay special attention not to mix them up. Storage area should be outfitted with anti-leak emergency treatment equipment. When check and accept the product, pay attention to



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the name of the chemical and the date of testing. Consign the product in the principle of "first in, first out".

Part 8 Contract Control /Personnel Protection

Maximum density:

China MAC (mg/m^3): no information

China PC-TWA (mg/m^3): no information

China PC-STEEL (mg/m^3): no information

Soviet Union MAC (mg/m^3): no information

Unite States TLV-TWA: no information

Unite States TLV-STEEL: no information

Monitoring method: gas chromatography

Engineering control: fully ventilated

Respiration protection: If concentration in the air surpasses the regulatory requirement, wear self-contained breathing apparatus (half mask).

Eye protection: Wear anti-chemical protective glass if necessary.

Body protection: Wear normal protective working clothes.

Hand protection: Wear normal protective goggle.

Other protection: Not inhale high concentration of this product. Before enter into column or limited space or other high concentration area for operation, designate personnel to monitor.

Part 9 Physical and Chemical property

Appearance and properties: colourless and transparent liquid with a slight scent of ether.

PH value: No information.

Melting point: Not available

Boiling point: -26.1°C

Liquid density: $1206\text{kg}/\text{m}^3$ (25°C)

Saturated vapour density (boiling point): $5.25\text{kg}/\text{m}^3$

Saturated vapour pressure (kPa): No information

Critical temperature (K): 374.25

Critical pressure (MPa): 4.06

Octanol/water logarithm value: No information

Flash point ($^{\circ}\text{C}$): Not applicable

Ignitron temperature: Not applicable

Upper explosive limit [% (V/V)]: Not applicable

Lower explosive limit [% (V/V)]: Not applicable

Dissolubility: This product can be dissolved in water, it can also be dissolved in alcohol and aether.



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Application: Used in refrigerant, blowing agent, cosmetics and pharmaceutical sectors.

Part 10 Stability and Reactivity

Stability: Stable

Condition that should be avoided: high temperature

Forbidden mixture: No information

Aggregation hazard: Not exist

Decomposed product: Poisonous HF and carbon-fluorine-oxygen compound.

Part 11 Toxicology Information

Acute toxicity

LD₅₀: Not available

LC₅₀: Not available

Pungency: Not available

Part 12 Ecology Information

Biologic toxicity: No information

Biologic degrade: No information

Non-biologic degrade: No information

Part 13 Waste Disposal

Waste property: No information

Waste disposal method: It is burned before the waste mix up with other fuel, pay attention not to produce phosgene, the hydrogen halide that come from incinerator will be removed from acid scrubber.

Attention: Dispose of according to relevant national regulation.

Part 14 Transportation information

Hazard matter number: 2903399090

UN number: 3159

Class No.: 2.2

Packing marker: Non-flammable gas

Packing category: III class package

Packing method: Iso tank, Ton tank or Steel Cylinder

Attention: Fix valve protection caps during the transportation, put steel cylinder flat, the mouth of cylinders toward the same direction, not across; The height should not surpass the protective balustrade of transporting car and firmly secured with triangle



wood headlock to prevent rolling. It is forbidden to mix up with food chemical during transportation. In summer, transport at morning or evening, avoid sunshine. Drives by relevant regulation, not park the transportation vehicle at downtown or dense-population area.

Part 15 Regulation Information

“Hazardous chemical safety management regulation”, The No.334 order of china’s state department, effective date: 15th, March, 2002

“The regulation of chemical using in working place” It regulate the using, production, storage, transportation and pack and unpack of hazardous chemical.

In the standard of Label and Marking of Common Hazardous Chemical(GB13690-92), this product is classified as 2.2 category non-flammable gas.

This CSDS is written according to “Regulation of writing chemical safety data sheet”(GB 16843-2000).

Part 16 Other Information

Reference:

- 1 “Complete chemical hazard safety data sheet”, published by chemical industry publish house, 1997
- 2 “Occupational medicine in China” published by people’s sanitation publish house, 1999
- 3 “Manual of common chemical hazard safety”, published by China petroleum publishing house, 1998
- 4 “Environmental statistic manual of chemical toxicity regulation”, published by China environmental science publishing house, 1992