Difluoromethane
(R32)
Material Safety Data Sheet

Company name: ZHEJIANG QUHUA FLUOR-CHEMISTRY CO,. LTD
Address: Juhua Group Corporation Quzhou city, Zhejaing province
Emergency telephone: 0570-3612021
Effective date: June 28,2021

1 The chemical and logo of enterprise

Name: difluoromethane
Chemical name: R32
Manufacturer name: ZHEJIANG QUHUA FLUOR-CHEMISTRY CO,. LTD
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MSDS number：**SDS/FH 09-2021**
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Main applications: mainly used as dry etching agent, and as a substitute for low-temperature refrigerant R-502, or mixed respectively with HFC-134a or HFC-152A to form new blended refrigerant to replace HCFC-22
Restricted use: no data available

Part 2 Description of hazard

GHS hazard category：

Physical hazard	Health hazard	Environment hazard
Flammable gas：**1 category**	Un-classification	Un-classification
high-pressure gas：**Liquefied gas**		

Labeling and precautionary illustration：

pictographic chart：

Key word：**hazard**

Hazard description：**high inflammable gas, high pressure gas, explosive when heated**

Precaution：

[Preventive measures]
Away from heat sources, sparks, open flames, and hot surfaces
Smoking is forbidden.
If heated, the pressure within vessel increases, causing the risk of explosion.
Take measures to prevent static electricity。
Incident responses: Leakage can catch fire: Do not extinguish fire unless air leakage can be safely stopped
Remove all ignition sources if it is safe to do so
Safe storage:
Store in a cool, well-ventilated place.
Protect from the sun
. Waste disposal
The disposal of the product, contents and containers shall be in accordance with national and local regulations.
Main symptom: non-toxic at normal temperature, can cause rapid asphyxiation effect.
Emergency summary: In the event of an accident or if you feel unwell, seek medical attention immediately (show safety label and SDS whenever possible).

Part 3 Information of component/ingredient

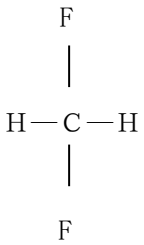
pure ☑ mixture ☐

chemical name：difluoromethane

product name：HFC-32; R32; F32。

molecular formula：CH_2F_2。

Structural formula:



Molecular weight：52.0234

Hazard name	content（%）	CAS №
difluoromethane	≥99.80	75-10-5

Part 4 Emergency measure

Inhalation: Leave working field, go to the place with fresh air immediately. Keep respiratory tract open. Supply oxygen If breathing is difficult,. If heartbeat and breathe stop, execute artificial respiration immediately and admitted to hospital.
Skin contact: Using lukewarm water under 41℃. When contact with high dose, take off the contaminated cloth, wash with lukewarm water. If frostbite, admitted to hospital.
Eye contact: Using lukewarm water to wash for at least 15 minutes, hold up eyelid, use running clean water or physiological saline solution to wash, admitted to hospital.
Digestion: No information available.
Main symptom: can cause rapid asphyxiation effect. Vapors at high concentrations can cause disorientation, dizziness, nausea, vomiting, anesthetic effects, cardiac rhythm disturbances, hypotension, and death from asphyxia at very high concentrations. Skin and eyes contact with liquid products can cause damage such as frostbite.
Medical considerations: It is important that medical staff be informed of the substances involved and take protective measures to protect themselves. Keep the patient under observation and take appropriate measures to prevent the onset of delayed symptoms such as shock, dyspnea, and convulsions. Show this safety specification to the doctor on site.

Part5 Fire fighting measure

Fire extinguishing method: cut off the source immediately when the surrounding fire. If the gas source cannot be cut off, extinguishing the burning gas is not allowed. Spray water to cool the container and remove the container from the fire to an open area if possible.
Suitable extinguishing agent: watery mist, foam, carbon dioxide extinguisher.
Unsuitable fire extinguishing agent: no data available.
Harmful combustion products: carbon dioxide, hydrogen fluoride, fluorocarbon**.**
Especially dangerous: in case of high heat, the pressure in the container increases, and there is the danger of cracking and explosion. Mixed with air into an explosive mixture, spark or high heat caused explosion, and phosgene generation.
Special fire extinguishing method: cut off the air source. Do not extinguish the flame at the leak without cutting off the gas source. Fire fighters must wear air respirators and full-body fire protection suits to fight fire upwind. If possible, move containers from the fire to an open area. Spray water to keep the fire container cool until the end of the fire.

Special protective equipment for fire protection personnel: Fire protection personnel must wear positive pressure air breathing apparatus and full body fire protection suit.

Part 6 Emergency measure for leakage

Protective measures, protective equipment and emergency handling procedures for operators: eliminate all ignition sources. The warning area shall be designated according to the influence area of vapor diffusion, and the irrelevant personnel shall evacuate to the safety area from the crosswind and upwind. It is recommended that emergency personnel wear positive pressure self-contained breathing apparatus. All equipment used during operation should be connected to the ground. Spray water inhibits steam or changes the direction of steam clouds, preventing water flow from contact with leaks. Do not use water to directly impact the leakage or leakage source.
Environmental protection measures: cut off the source of leakage as far as possible. Prevent gas diffusion through sewers, ventilation systems and enclosed Spaces.
Methods of receiving, removing and disposal materials used for leaking chemicals: disposal by controlled incineration. The hydrogen halide discharged from the incinerator is removed by an acid scrubber.
Preventive measures against secondary hazards: no data available**.**

Part 7 Handling Dispose and storage

Operation disposal
Precautions for safe disposal: airtight operation and comprehensive ventilation. Operators must be specially trained and strictly abide by the operation procedures. Keep away from flammable and combustible materials. In case of high concentration contact, self-priming filter gas mask (half mask) can be worn work clothes, wear general protective gloves. Prevent gas leakage into the workplace air. Avoid contact with oxidants.To prevent damage of cylinders and accessories, please unload lightly when handling. Equipped with leakage emergency treatment equipment.
storage
Safe storage: store in a cool and ventilated warehouse. Keep away from fire and heat source and avoid direct sunlight. The storage temperature should not exceed 30℃.
Storage technical measures: use explosion-proof lighting and ventilation facilities. Do not use mechanical equipment and tools that may cause sparks. The storage area should be equipped with leakage emergency treatment equipment.
Forbidden materials: should be stored separately with combustible, combustible, oxidizer, do not mix storage.
Packing material: generally use steel cylinder packing.

Part 8 Contract Control /Personnel Protection

Maximum density:
China MAC (mg/m^3): not available
China PC-TWA (mg/m^3): not available
China PC-STEL (mg/m^3): not available
Soviet Union MAC (mg/m^3): not available
Unite States DUPONT-TWA: 1000ppm（8/12hr）
Unite States TLV-STEL: not available
Engineering control: Operate in closed area, fully ventilated
Respiration protection: There is no need for special protection, when contact with high concentration, wear self-containing filter mask (half mask).
Hand protection: Wear appropriate protective glove.
Eye protection: Wear chemical protective goggle.
Skin and Body protection: Wear appropriate protective working clothes.
Other protection: Avoid inhale gas of high concentration. When enter into column, limited space or other high concentration area, appoint person specially to monitor.

Part 9 Physical and Chemical property

Appearance and properties: colourless gas .
Odor:slight scent of ether
PH value: not available.
Melting point: -136℃
Boiling point: -51.7℃
Flash point (℃): Not applicable
Upper explosive limit [% (V/V)]: 33.4
Lower explosive limit [% (V/V)]: 12.7
Saturated vapour pressure：202.65kg/m^3 (28.4℃)
Relative density: 1.1
Relative vapour density: 1.8
Dissolubility: Dissolvable in water, 4.4g/l(25℃), dissolved in fat.
Critical temperature (℃): 78.25
Critical pressure (MPa): 5.83
Octanol/water logarithm value: not available
Ignitron temperature: Not applicable
Decomposition temperature: no data.

Part 10 Stability and Reactivity

Stability: Stable
Hazard response: no data available.

Condition that should be avoided: Sunshine, heat
Forbidden mixture: Strong oxidizer, alkali metal, alkali-earth metal,flammable substance
Decomposed product: Carbon dioxide, hydrogen fluoride. Fluorocarbon acid

Part 11 Toxicology Information

Acute toxicity: $LD_{50:}$ not available
LC_{50}: $_{4900}$ mg/m^3, 4 hours (inhaled by rats)
Skin irritation or corrosion: no data available.
Eye irritation or corrosion: no data available.
Respiratory or skin irritation: no data available.
Mutagenicity: no data available.
Carcinogenicity: no data available.
Reproductive toxicity: no data available.
Specific target organ system toxicity - single contact: no data available.
Specific target organ system toxicity - repeated exposure: no data available.
Inhalation hazard: No data available.
Toxodynamics, metabolism and distribution: no data available.

Part 12 Ecology Information

Biologic toxicity: fish: **LC_{50} = 1507 mg/l/96h** (freshwater fish)
Carapace: EC_{50} = 652 mg/l/48h（water flea）
Flea: EC_{50} = 142 mg/l/96h（green flea）
Durability and degradability: No information
Non-biologic degrade: No information
Potential biology accumulation: no information
Mobility of soil: no information
Other hazardous effect: no information

Part 13 Waste Disposal

Waste property: Hazardous waste
Waste disposal method: Dispose of in incineration, fully incinerate after mixing with dissolved fuel. Remove the hydrogen halide come out of incinerator by acid cleaner.
Attention: when incineration, it should be fully incinerated to prevent second pollution.

Part 14 Transportation information

UN number: 3252
UN transportation name: difluoromethane
UN hazard category: 2.1 flammable gas
Hazard matter number: not available
Packing category: Ⅲ class package

Transportation marking:

Marine pollutant: none

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

Work Safety Law of the People's Republic of China (adopted at the 28th Meeting of the Standing Committee of the Ninth National People's Congress on June 29, 2002, and adopted on June 10, 2021) The 29th Session of the Standing Committee of the 13th National People's Congress of the People's Republic of China adopted the Decision of the Standing Committee of the National People's Congress on amending the Work Safety Law of the People's Republic of China, which will take effect on September 1, 2021);
Law of the People's Republic of China on the Prevention and Control of Occupational Diseases (adopted at the 24th Session of the Standing Committee of the Ninth National People's Congress on October 27, 2001, amended for the first time on December 31, 2011, and amended for the second time on July 2, 2016) Amended 3rd on 4 November 2017, 4th on 29 December 2018);
Environmental Protection Law of the People's Republic of China (adopted at the 11th Session of the Standing Committee of the Seventh National People's Congress on December 26, 1989, revised on April 24, 2014, and effective as of January 1, 2015);
Regulations on the Safety Administration of Hazardous Chemicals (Order No. 344 of The State Council, effective as of March 15, 2002, revised on February 16, 2011) Modified on 7 December 2013);

Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste (adopted at the 16th Session of the Standing Committee of the Eighth National People's Congress on October 30, 1995, and effective as of April 1, 1996) Revised at the 17th Session of the Standing Committee of the 13th National People's Congress on April 29, 2020, and effective as of September 1, 2020);
Regulations on the Safe Use of Chemicals in the Workplace (Ministry of Labor [1996] No. 423);
Regulations on Labor Protection in Workplaces where Toxic Substances Are Used (Order 352 of The State Council [2002]);
Name List of Dangerous Goods (GB12268-2012);
Occupational exposure limits to harmful factors in the workplace - Part 1: Chemical harmful factors (GBZ2.1-2019);
Contents and Project Sequence of Technical Specification for Chemical Safety (GB/T16483-2008);
Provisions on preparation of Chemical Safety Labels (GB 15258-2009)
Guide to the Preparation of Technical Instructions for Chemical Safety (GB/T 17519-2013);
Specification for Classification and Label of Chemicals (GB 3000-2013);
Catalogue of Hazardous Chemicals (2015 edition) (Announcement [2015] No.5 of 10 departments of The State Administration of Work Safety);
"Hazardous Chemicals Catalogue (2015) Implementation Guide (Trial)" (General Office of Work Safety Administration 3 (2015) No. 80) and
Classified Information Table of Hazardous Chemicals.

Part 16 Other Information

The information contained in this MSDS is prepared according to the expertise we learned, only for the purposes of health, safety and environment concerns. The information would not serve as any kind of guarantee, pleas provide any necessary training for the personnel that may use, dispose of or operation this product.