

Miragas Co., Ltd.

SDS created on: Oct. 15, 2021

Section 1 — Product and Company Identification

Chemical Name: Difluoromethane

Other Names: Freon 32; R32

Formula: CH₂F₂

Supplier Name: Miragas Co. Ltd.

Supplier Address: Zhucun Industrial Park, Pengpo, Yichuan, Luoyang, Henan 471311, China

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Recommended Usage: Synthesis of fluorinated chemicals and specialty chemicals.

Restriction on Use: No restrictions.

Section 2 — Hazards Identification

Emergency Overview: Highly flammable gas

GHS Hazard Classification: According to the standard series of the chemical classification, warning label and warning specification, this product is a flammable gas, category 1.

Label Elements:

Pictograms:



Warning Words: Danger

Hazard Information: Extremely flammable gas, liquefied gas under pressure, may explode if heated.

Precautionary Statement:

Preventive Measures: Avoid heat source, fire source, open fire, hot surface. No smoking in workplace.

Emergency Response: When there is a leakage, evacuate personnel to safe areas upwind. Please refer to Section 6 "Accidental Release Measures" for details.

Safe Storage: Store in weatherproof and well-ventilated place.

Waste Disposal: Return container and unused product to supplier. Do not dispose of unused products without authorization.

Physical And Chemical Hazards: May form explosive mixtures with air. Exposure to heat, spark, flame or oxidant may cause combustion and explosion. Decomposition under high temperature may release toxic fluoride gases. The gas is heavier than air and will spread along the ground and travel a considerable distance to a source of ignition and flash back, causing fire or explosion.

Health Hazards: May displace oxygen and cause suffocation. Inhalation of high concentration gas may cause central nervous system depression and arrhythmia. Skin contact with liquid or vapor may result in frostbite.

Environmental Hazards: None.



Section 3 — Composition/Information on ingredients

Chemical Category: Single substance

Hazardous Component: Difluoromethane

Concentration or Concentration Range: $\geq 99.9995\%$

CAS Number: 75-10-5

Shelf Life: 12 months

Section 4 — First Aid Measures

First Aid:

-Skin Contact: May cause frostbite. Remove contaminated clothing, flush with plenty of warm water for a few minutes, then immediately seek medical treatment.

-Eye Contact: May cause frostbite. Flush with plenty of water for at least 15 minutes, then immediately seek medical treatment.

-Inhalation: Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If cardiac arrest occurs, give cardiopulmonary resuscitation and get medical attention immediately.

-Ingestion: Not a potential route of exposure.

Section 5 — Fire-Fighting Measures

Special Hazard: Flammable gas, forms explosive mixtures with air. Can easily ignite and explode under open fire and high temperatures.

Fire Extinguishing Method and Extinguishing Agent: Shut off gas supply before fighting the fire. Use water mist to reduce combustion by-products formed in the air. If the gas supply cannot be cut off, wait until it burns out at the leakage spot. Cool down the container exposed to the fire by spraying water from distance and remove the container away from the fire if possible. Suitable fire extinguishing agents are foam, carbon dioxide and dry powder.

Fire Extinguishing Precautions and Measures: Wear SCBA, fight fire upwind. Shut off the gas supply first, if unable, do not extinguish the flame at the leakage spot. Spray water to cool down the container until the fire is extinguished.

Section 6 — Accidental Release Measures

Operational Personnel Protection Measures, Protective Equipment and Emergency Response Procedures:

Evacuate the contaminated areas quickly to areas upwind. Emergency response personnel shall wear SCBA and fire-proof clothing when entering the leakage site and isolate the area and restrict entrance. Remove all flammable materials and fire source and provide maximum ventilation. Monitor CH₂F₂ concentration in the air, do not enter areas with CH₂F₂ concentration higher than 2.8% (20% of LEL). Imminent fire and explosion hazard when CH₂F₂ concentration higher than 14%. If possible, shut off the gas supply and isolate the leaking cylinder. If the cylinder valve leaks, contact the supplier for further help. If leakage occurs in customer's system, close the cylinder valve and be sure to release the system pressure and purge with inert gas before any maintenance.

Environmental Protection Measures: Recover all the unused gas to avoid emissions to the atmosphere.

Methods and Materials for Collection and Disposal of Leaked Chemicals: incinerate in furnace. Incinerate on



the spot if not dangerous.

Preventive Measures to Prevent Secondary Hazards: Wear SCBA, shut off the gas supply, remove all flammable materials and fire source, provide ventilation, evacuate affected area quickly. Install the corresponding gas monitoring and alarm system.

Section 7 — Handling and Storage

Handling Notes: Do not pull, roll, slide or drop the cylinder. Move the cylinder with the appropriate trolley. Do not try to pick up the cylinder by the cap. Ensure that the cylinder is fixed in place throughout its use. Use regulator to safely supply gas from the cylinder and use a one-way valve to prevent back flow. Use a well-designed pipeline with adequate pressure rating. Do not heat any part of the cylinder with open fire or adjacent source of heat. Temperature should not exceed 52°C on any part of the cylinder. Once the cylinder is connected to the system, the valve should be opened slowly with caution. If it's difficult to open the cylinder valve, stop using it and contact the supplier. Do not insert tools such as a wrench, screwdriver, etc. into the valve cap, it may damage the valve and cause leakage. Use an adjustable wrench to open the over-tightened or rusty cap. All delivery systems and related equipment must be grounded. All electrical equipment must be sparkle-proof or explosion-proof. The gas shall be compatible with all common building materials. Pressure rating requirements should be considered when selecting materials and designing systems. Special Note: The storage and operation on compressed gases should follow the provisions of CGAP-1 of the CGA manual (ph. 703-412-0900). Any related local regulations should be followed.

Storage Precautions: Store in well-ventilated, safe, and weatherproof location. Cylinders shall be placed upright. Keep valve closed and sealed with cap. Keep cylinder cap tightly installed. There should be no fire source in the storage area and all electrical appliances must be explosion-proof. The storage area shall conform to the requirements of National Electric Codes hazard areas of Category 1. The storage area should be at least 20 feet away from the oxygen and oxidant storage area, or isolated with over 5-feet-tall nonflammable barriers with half-hour fire rating. "No Fire" warning signs shall be installed in storage and operation areas. The temperature must be kept lower than 125°F (52°C) in the storage area, which should be kept away from main entrances and emergency exits. Store empty and full cylinders separately. Use first-in, first-out system to avoid extended storage time.

Section 8 — Exposure Controls/Personal Protection

Exposure Limit: No data

Biological Limit: No data

Monitoring Methods: If needed, monitor oxygen level in working area. Local exhaust and ambient ventilation systems must be installed in working area.

Engineering Control: Provide adequate ventilation and/or dedicated exhaust to prevent accumulation of gas. Monitor oxygen level in working area and ensure it is no less than 19.5%.

Respiratory Protection: Wear SCBA to enter area with oxygen level lower than 19.5%.

Eye Protection: Wear safety glasses.

Hand Protection: Leather gloves are recommended.

Skin and Body Protection: Wear protective clothing for general operations. Safety shoes are recommended when moving cylinders.

Other Protection: Ensure ventilation and no smoking in working area.



Section 9 — Physical and Chemical Properties

Physical and Chemical Properties: Colorless gas with a slight ester taste

PH Value: No data

Boiling Point (°C): -51.7

Relative Vapor Density (Air = 1): 1.85

Heat of Combustion (kJ/kg): 3509.9

Critical Pressure (Mpa): 5.83

Flash Point (°C): -88.9

Decomposition Temperature (°C): No data

Upper Explosive Limit [% (V/V)]: 31

Odor Threshold: No data

Flammability: Flammable

Melting Point/Freezing Point (°C): -136.1

Critical Density: 0.43 g/cm³

Relative Density (Water = 1): No data

Saturated Vapor Pressure (Mpa): 1.702 @ 25°C

Critical Temperature (°C): 78.45

N-octanol/Water Partition Coefficient: 0.2

Ignition Temperature (°C): No data

Lower Explosive Limit [% (V/V)]: 14

Evaporation Rate: No data

Solubility: No data

Section 10 — Stability and Reactivity

Stability: Stable

Hazardous Reaction: No data

Incompatible Substances: Oxidants, alkali or alkaline earth metals, such as aluminum powder, zinc, etc.

Conditions to Avoid: High temperature, open fire

Hazardous Decomposition Products: Hydrogen fluoride

Section 11 — Toxicological Information

Acute Toxicity: No data

Eye Irritation/Corrosion: No data

Carcinogenicity: No data

Specific Target Organ Toxicity: No data

Toxicokinetics, Metabolism and Distribution Information: No data

Respiratory or Skin Allergies: Can cause suffocation. Long-term exposure can cause skin allergies.

Inhalation Hazard: May displace oxygen in the air to cause suffocation.

Skin Irritation/Corrosion: No data

Germ Cell Mutagenicity: No data

Reproductive Toxicity: No data

Section 12 — Ecological Information

Ecotoxicity: No data

Bioaccumulative potential: No data

Persistence and Degradability: No data

Mobility: No data

Section 13 — Disposal Considerations

Disposal Methods:

-Products: Return cylinders and unused products to supplier.

-Unclean Packaging: Return contaminated cylinder to supplier or dispose of following local regulations.

Disposal Notices: Refer to relevant national and local regulations before disposal.

Section 14 — Transport Information

United Nations Hazardous Chemicals Code (Hazard Code): No Data



United Nations Dangerous Goods Number (UN): 3252

United Nations Transport Name: Difluoromethane **United Nations Hazard Classification:** 2.1

Packing Group: -

Packing Method: Steel cylinders

Packaging Marks: Flammable gas

Marine Pollutants: None

Packaging (Yes/No): Steel cylinders

Transportation Precautions: cylinders should be placed upright in a well-ventilated truck for transport. Do not ship by passenger vehicle. Ensure the cylinder valves are tightly closed, valve cap and cylinder cap and installed before shipment.

Section 15 — Regulatory Information

Regulatory Information:

Regulations on the Safety Management of Hazardous Chemicals (Order No. 591 of the State Council of the People's Republic of China)

Supervision Regulation on Safety Technology for Gas Cylinder (TSG R0006-2014)

Safety data sheet for chemical products - Content and order of sections (GB/T16483-2008)

General specifications for transport packages of dangerous goods (GB12463-2009)

General rule for classification and hazard communication of chemicals (GB13690-2009)

Packing Symbols of Dangerous Goods (GB 190-2009)

Classification and code of dangerous goods (GB 6944-2012)

List of dangerous goods (GB12268-2012)

Catalog of Hazardous Chemicals (2015 Edition)

Provisions on the Administration of Road Transport of Dangerous Goods (2010)

Rules for storage of chemical dangers (GB15603-1995)

Rules for classification and labelling of chemicals - Part 3: Flammable gases (GB 30000.3-2013)

Rules for classification and labelling of chemicals - Part 6: Gases under pressure (GB 30000.6-2013)

Section 16 — Other Information

Notes: Revision every 3 years or when necessary.