Material Safety Data Sheet

SECTION I – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name in English : Difluoromethane (Halocarbon R-32) .

Chemical Name: HFC-32, Methylene Fluoride, Refrigerant Gas R-32.

Formula: CH_2F_2 .

SECTION II – COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Nature : Substance, Gas.

Chemical Name : Difluoromethane (R-32) .

Concentration: >=99.50%; >= 99.80%; >= 99.95%.

CAS-No.: 75-10-5.

SECTION III – HAZARDS IDENTIFICATION

Hazardous Classification: Class 2.1 Compressed Gas and Flammable Gas.

Emergency Overview: Difluoromethane poses a serious fire hazard when it is accidentally released, as it will form explosive mixtures with air.

Primary Routes of Entry: Inhalation, Skin Contact..

Adverse Human Effects:

Inhalation: Gross overexposure may cause: Central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness. Irregular heart beat with a strange sensation in the chest, "heart thumping", apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death.

Skin Contact: Immediate effects of overexposure may include: Frostbite, if liquid or escaping vapor contacts the skin. Significant skin permeation, and systemic toxicity, after contact appears unlikely. There are no reports of human sensitization.

SECTION IV – FIRST AID MEASURES

Thermal Burns: In the event personnel are burned as a result of a Difluoromethane release, if burns are first degree or second degree with closed blisters, flush area with cold water until pain subsides. Apply loose, moist, sterile dressings, and bandage. Treat for shock. If burns are second degree with open blisters or third degree, apply loose, dry, sterile dressings and bandage. Treat for shock. Transport victim immediately to hospital or emergency center. Burns over an area of 20% or more of body are life-threatening, medical attention should be immediately sought.
Eyes: If mechanical injury occurs, cover eye with bandage and seek medical attention.
Skin: In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit. Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention.
Inhalation: Remove victim(s) to fresh air, as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary.
Notes to Physicians and/or Protection for First-Aiders: Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should only be used with special caution in situations of emergency life support.

SECTION V – FIRE FIGHTING MEASURES

Flammability of the Product: Flammable gas.
Unusual Fire and Explosion Hazards: Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions .
Hazardous Combustion Products: Decomposition by elevated temperatures (fire conditions, glowing metal surfaces) may generate hazardous decomposition products common to other CFCs, HCFCs or HBFCs. These can include hydrogen fluoride, carbonyl fluoride, carbon monoxide, carbon dioxide and others.
Fire Fighting Media and Instructions: If possible, stop flow of product. Move away from the container and cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Consider downwind evacuation if material is leaking.

SECTION VI – ACCIDENTAL RELEASE MEASURES

Personal Precautions: Evacuate area. Ensure adequate air ventilation. Eliminate ignition sources. Do not enter areas where high concentrations may exist (especially confined or poorly ventilated areas) without appropriate protective equipment including a self-contained breathing apparatus.
Environmental Precautions: Try to stop release. Prevent from entering sewers, basements and work pits, or any place where its accumulation can be dangerous.
Clean up Methods: Ventilate area.

SECTION VII – HANDLING AND STORAGE

Handling: Do not puncture or incinerate container. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52° C (125° F).

SECTION VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

Authorized Limit Values: Difluoromethane
AEL * (DuPont) : 1000 ppm, 8 & 12 Hr. TWA
WEEL (AIHA) : 1000 ppm, 8 Hr. TWA
CHINA MAC: No information available.
Engineering Controls: Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.
Personal Protection:
Respiratory Protection: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.
Hand Protection: Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eye Protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Skin Protection: Work (such as leather) gloves are recommended when handling cylinders of this gas. Wear gloves appropriate to the specific operation for which Difluoromethane is used. Use triple gloves for spill response.

SECTION IX – PHYSICAL & CHEMICAL PROPERTIES

Appearance Form: Gas **Colour:** Colourless
Odour: Slight , ether-like **Molecular Weight:** 52.02
Boiling Point: -51.7° C (1,013 hPa) **Melting Point:** -136° C
Relative Density: gas 2.2 (air=1) **Relative Density:** liquid 1.1 (water=1)
Vapour Pressure 20° C: 13.8 bar **Autoignition Temperature:** 648 ° C
Flammability Range: 14-31 vol% in air. **Solubility in Water:** 4.4 g/L at 25° C
Octanol/Water Partition Coefficient: logPow=0.21 **pH:** Neutral
Specific Use(s): Refrigerant using in blends, Substitutes for HCFC22.

SECTION X – STABILITY AND REACTIVITY

Stability: Material is stable. However, avoid open flames and high temperatures.
Incompatibility With Other Materials: Incompatible with alkali or alkaline earth metals-powdered Al, Zn, Be, etc.
Hazardous Decomposition Products: Decomposition products are hazardous. This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrofluoric acid and possibly carbonyl fluoride.
Hazardous Polymerization: Will not occur.

SECTION XI – TOXICOLOGICAL INFORMATION

Acute Toxicity:
LC_{50} : 4 hr. (rat) - > 520,000 ppm / Cardiac Sensitization NOEL - 350,000 ppm
Subacute Toxicity:
Teratogenic NOEL (rat and rabbit) – 50,000 ppm
Subchronic inhalation (rat) NOEL – 50,000 ppm
Other Data: Not active in four genetic tests.

SECTION XII – ECOLOGICAL INFORMATION

General : When discharged in large quantities may contribute to the greenhouse effect.
Ozone depletion factor = 0
Global warming factor = 0.11
Degradability (BOD): Difluoromethane is a gas at room temperature; therefore, it is unlikely to remain in water.
Environmental Stability: Difluoromethane will mainly volatilize from the atmosphere; however, Difluoromethane is resistant to hydrolysis so any remaining compound not lost by volatilization can persist. The estimated Tropospheric lifetime is 16 years.

SECTION XIII – DISPOSAL CONSIDERATIONS

RCRA: Not a RCRA hazardous waste.
General: Avoid discharge to atmosphere. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere.Do not discharge into any place where its accumulation could be dangerous. Contact the supplier if guidance is required.
Preparing Wastes for Disposal: Product removed from the cylinder must be disposed of in accordance with appropriate National and local regulations. Do not dispose of locally.

SECTION XIV – TRANSPORT INFORMATION

Hazard Class : 2.1.
UN-No. : 3252.
Marking : 4.
Primary label: Combustible Gas.
Packing group : II.
Packing Method: Steel cylinder 920L 670KG net

SECTION XV – REGULATORY INFORMATION

* Regulations on Labor Protection in Workplaces with Toxic Substances (State Council Decree 352 [2002]),
* Regulations on the Control over Safety of Dangerous Chemicals (State Council Decree 344 [2002]),
* Regulations on the Safety Use of Chemicals in Workplaces (Department of Labor, Reg 423 [1996]),
* Regulations on the Prevention and Control of Environmental Pollution by Solid Waste (Presidential Decree 31 [2004]), The corresponding rules and standards include: Common dangerous chemical classification and labelling (GB13690-92).

SECTION XVI – OTHER INFORMATION

Sources of key data used to compile the datasheet:
* National Industrial Chemicals Notification and Assessment Scheme Full Public Report Difluoromethane Du pont (Australia) Ltd,
* The BOC Group, Inc. (Canada) MSDS G-465 2000.6.11

The information given corresponds to the current state of our knowledge and experience of the product, and is not exhaustive. It is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification.

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